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TYPOLOGY OF DENSITY RANGES II: CONTRASTIVE AND NON-CONTRASTIVE SYNTAX

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1.0. In Typology of Density Ranges I (IJAL 26.198–205), we treated contrastive transpositions in syntax as one kind of operator, but postponed consideration of the kind of syntax which reorganizes expression without contrast when transpositions occur. Non-contrastive syntax is now considered for density range typology, in terms of sentence profiles. For purposes of this paper only one English sentence (previously cited to show that singular noun, *man*[1], may precede plural verb, *are*) is presented in scatter profile, and all permutations of non-contrastive transposition are shown to be possible for this sentence which remains equally assertive, equally declarative in all these reorderings. The permutations shown are among the permutants, X Y Z, segmented experimentally to maximize the non-contrastive transpositional possibilities among words or strings of words in this particular sentence (**1.3**, below).

Sentence profiles of an adequate sample of English sentences would give not only the favorite (major) sentence types, and not only the minor sentence types in Bloomfield's terminology (or word order typology, in Greenberg's terminology), but also the variability possible for each type. This kind of variability can be elicited. Can it be extended to the ungrammatical? The question of degrees of grammaticalness, raised by Chomsky, is a consequence of a polarity in which the known-to-occur is opposed to what can be generated (beyond-what-is-known-to-occur), without the intermediary of what can be elicited.[2]

[1] Rulon Wells, Immediate Constituents, Language 28.81–117 (1947): "Thus *man* occurs in the environment *a* ( ) *are*, i.e. the morpheme-sequence *a man are* occurs; witness the utterance *The sons and daughters of a man are called his children.*" In this sentence, as adapted for our purposes, *are called* is contracted to *are*. The expanded *are called* would be equally suitable for non-contrastive syntax (yielding the following allo-permutants: Z_1 *are called his children*, Z_2 *children are called*, Z_3 *are called the children*); but in contrastive syntax, **2** below, *are called* would require more permutants than *are*.

[2] A decade and a half ago, Rulon Wells (op. cit.) implied (fn. 3) that he could satisfy the problem of grammaticalness—demarcating "what is grammatically impossible (ungrammatical) from what does not occur"—by having his IC theory accept as its legitimate data only (and all) "those utterances known to occur." This practise, followed in general by field workers, is now challenged by the newly arrived logicians who are in the habit of making up their own utterances to exemplify what is grammatical and what is ungrammatical, beside stating rules to treat utterances known to occur (naturally: by informants innocent of linguistic theory). Our sentence profile (segmenting and transposing permutants) begins with utterances known to occur naturally rather than by inventing utterances with linguistic theory in mind; but it also goes beyond 'utterances known to occur' since syntactic variabilities of those utterances are elicited.

See now the more-modern-than-Hockett treatment of Wells' sentence—by generative grammar

In learning a language partly by analysis, partly by speaking, it is possible to favor one or two possible permutant orders whenever one talks—that is, to follow an order which would not be corrected by native speakers of the language since they too follow that order, but infrequently—that is, nearer the lower rather than the upper end of the density range of possible permutant orders. Hence a second-language speaker might be quite correct in what he says, remain uncorrected, and yet give a cumulative effect of being an utter foreigner. One native speaker, troubled by this cumulative effect, asked "Why don't you speak the language like us, even when you speak without making mistakes?" Recently, a second language speaker, unaware that he produced the effect in question, reached such awareness while constructing scatter profiles of sentences—sentences spontaneously uttered by his informant—which turned out to favor different orders of permutants than the order which he himself was in the habit of following.

The sentence profile for our example is given in a series of successive lines, under the sentence itself. Each line of information or substitution or transposition is given a parenthetic number, as line (1) which gives the scatter profile for this sentence, and line (2) which substitutes a particular morpheme or morpheme class of the language for the more general line (1) symbols in the scatter profile (M, mM, Mm, mMm, -m, m-, -m-, and unhyphenated m), matching spelling orthography words in the sentence. The successive lines numbered parenthetically in the sentence profile chart, (1) ff, are followed by explications **1.1** ff, below, with the post-decimal sectional numbers cross-referenced to parenthetic numbers for successive lines in the profile chart.

(Where the language being explicated is unknown to the reader, sentences are written phonemically rather than in spelling orthography; and the successive lines of information give translation after scatter profile and morpheme class substitutions—as in **5**, below.)

	The	*sons*	*and*	*daughters*	*of*	*a*	*man*	*are*	*his*	*children*
(1)	m-	Mm	-m-	Mm	-m-	m-	M	mM	mM	Mm
(2)	P-	N-s	-P-	N-s	-P-	P-	N	$\frac{V}{sup}$	$\frac{Pr}{sup}$	N-ren

(3) XYZ=	X_1(*the sons and daughters*)	Y_1(*of a man*)	Z_1(*are his children*)
	X_2(∼ *sons and daughters*)	Y_2(∼*a man's*)	Z_2(∼ *children are*)
	X_3(∼ *his sons and daughters*		Z_3(∼ *are the children*)
(4) YXZ=	Y_2(*a man's*)	X_2(*sons and daughters*)	Z_1(*are his children*)
(5) ZYX=	Z_2(*children are*)	Y_2(*a man's*)	X_2(*sons and daughters*)
(6) XZY=	X_2(*sons and daughters*)	Z_3(*are the children*)	Y_1(*of a man*)
(7) YZX=	Y_2(*a man's*)	Z_2(*children are*)	X_3(*his sons and daughters*)
(8) ZXY=	Z_2(*children are*)	X_2(*sons and daughters*)	Y_1(*of a man*)

Sentence Profile Chart

1.1. The scatter profile of the original sentence (m- Mm -m- Mm -m- m- M mM mM Mm) shows that four out of the ten words in the sentence are quasi-independent minor morphemes (small m) with unilateral or bilateral linkage with words including a major morpheme (big M). Thus the first word in the sentence, *the* (m-), is unilaterally linked with the following *sons* as well as *daughters*. However, *and* (-m-) is bilaterally linked with the immediately preceding *sons* and following *daughters*. So also, *of* (-m-) is bilaterally linked with *sons and daughters*

(one of more than one beyond-what-is-known-to-occur kinds of grammar), namely, Fred W. Householder, Jr., Review of Charles F. Hockett, A Course in Modern Linguistics, Language 35.503–527 (1959).

and with *a man*. But *a* (m-) is unilaterally linked with the following *man*.

The scatter profile also shows that six out of the ten words include major morphemes (M). Of these, the first two Mm and the last Mm are combined with one kind of dependent minor morpheme, namely affix (or more specifically, the plural suffix, -s ~ -ren: *sons*, *daughters*, *children*). Only one major morpheme (M) is uncombined, since it appears with neither affix nor operator (*man*). The two remaining words with included major morphemes (mM) reflect the effect of combinability with an operator (or more specifically, suppletion: *are*, *his*).

1.2. Line (2) is simply more specific than line (1), and thereby less abstract, by virtue of substituting the appropriate English form class. This substitution is for all instances of M (major morphemes) and for all instances of the quasi-independent or free minor morphemes (m- and -m-) and for the dependent m before M (mM). For the latter (mM) the general class of the operator is substituted (sup 'suppletion', given in the chart under the specification of the form class).

For dependent or bound m after M (Mm), the affix morpheme is given by morph shape. In this sentence the morph shapes for the m in Mm are -s (*son-s*, *daughter-s*) and -ren (*child-ren*); these instances of m in Mm might instead have been given some such single index number as 27 had we cross-referenced them to an inventory in which all allomorphs for marking plural were given, together with morphophonemic rules.

1.3. Line (3) makes two cuts among the words of the sentence in order to obtain as many strings as possible which will be transposable in non-contrastive syntax. The cuts are not made successively, as they might be under the binary bias of immediate constituent cuts; they are made experimentally, and simultaneously. The permutation possibilities resulting, after cuts are made, are attested by informant acceptance of the transpositions proposed. Two cuts yield three transposable strings which are hereinafter termed permutants, and labeled XYZ. Not counting the possibility of repeating or omitting any given permutant, the maximum permutations of the three permutants, as labeled, would be:

XYZ	YXZ	ZYX
XZY	YZX	ZXY

This maximum number of six permutations is actually attained, as is shown in lines (3) to (8) inclusive. In line (3), allo-permutants are given for each permutant; additional transposability is possible within some of the permutants (e.g. inverting, to obtain *the daughters and sons*), but such additional freedom of word order is not relevant to the consideration of the six permutations, though it might be relevant to other considerations (e.g. the iconic value of enumerating *sons* before *daughters*). The allo-permutants of each permutant are obligatory: they show reordering, contraction and expansion called for by the transpositions of permutants in the six permutations. The scatter profile of line (1) may be arranged in three parentheses to show permutants in the order XYZ:
X (m- Mm -m- Mm) Y (-m- m- M) Z (mM mM Mm).

1.4. Compare the scatter profile of line (4), with permutants arranged YXZ:
Y (m- Mm) X (Mm -m- Mm) Z (mM mM Mm).
In the permutant Y, the m of Mm is substitutable by a morphemically different suffix (possessive -'*s*) than the pluralizer suffix (-s ~ -ren) which is substitutable for other instances of m in Mm. Until substitutions are made, however, differences of morph and morpheme and different quantities of each are unspecified.

1.5. Compare the scatter profile of line (5), with permutants arranged ZYX:
Z (Mm mM) Y (m- Mm) X (Mm -m- Mm).

1.6. Compare the scatter profile of line

(6), with permutants arranged XZY:
X (Mm -m- Mm) Z (mM m- Mm) Y (-m- m- M).

1.7. With permutants arranged YZX:
Y (m- Mm) Z (Mm mM) X (mM Mm -m- Mm).

1.8. With permutants arranged ZXY:
Z (Mm mM) X (Mm -m- Mm) Y (-m- m- M).

1.9. The above shows the maximum permutations for non-contrastive syntax when three permutants are involved. It would be possible to cut the original sentence so as to yield not three but four permutants, XYZ′ Z″, and this would make possible additional reordering, as XZ′YZ″: X (*sons and daughters*) Z′ (*are*) Y (*a man's* Z″ (*children*).
However, it would also lead to permutations like XYZ″Z′ which would not gain informant approval; namely, X (*the sons and daughters*) Y (*of a man*) Z″ (*his children*) Z′ (*are*).

2. The syntactic variability possible in a given 'same sentence' is measured by its non-contrastive rather than by its contrastive transpositions. This is by definition. If any transposition turns out to be contrastive, a new sentence is said to be formed, but a new sentence may be formed in other ways also (see below). However a new sentence is formed, its variability can be stated in terms of non-contrastive syntax. For any language as a whole, then, the sum of its non-contrastive transpositions (for different sentences) is a measure of syntactic variability in that language.

Any language for which an abundant collection of texts has been made certainly permits one to find instances of contrastive syntax, if they exist; and if not, to raise a question about language universals: do all languages operate with grammatical contrast in syntax? Suppose the texts in a particular language failed to show instances of contrastive syntax, and further, that the text collection were extensive and varied. The suggestion to elicit syntax would seem more potentially rewarding for such a language than a dogged determination to collect yet another volume of volunteered, non-directive texts. Eliciting syntax, as in the following pair of examples, is done by extrapolation or extension of SHARED MORPHEME ELICITING, previously described in reference to word morphology.[3]

In response to the following directive concerning our example above, 'alter the sentence so that it ends with *is his child*', the trained informant might well say *The son or daughter of a man is his child.* In this sentence, with singular kin terms, the permutants can be arranged and transposed as in the sentence with plural terms. Compare the scatter profile of the original sentence ending in *are his children*—X (m- Mm -m- Mm) Y (-m- m- M) Z (mM mM Mm)—with that ending in *is his child*; the latter is identical for permutant Y, but morphologically simpler for permutant X (m- M -m- M) and for permutant Z (M mM M), if the singular and actor forms of major morphemes are represented by uncombined M, with which affixes (Mm) and operators (mM) are combinable. The new sentence does not show contrastive syntax; it does show the same possibilities of non-contrastive syntax as were found in the original sentence. The differences between the scatter profiles of the two sentences represent word morphology (M in place of Mm in X, and M again in place of mM in Z) and selection (*or* in place of *and* for -m- in X) sufficient to mark the difference in number category—plural in the original sentence, singular in the new sentence. Here we obtain a new sentence—by change in morphology and selection—which is, however, non-different in respect to permutants and their transposability.

In response to another directive concerning our original example, 'alter the sentence so that it asks a question', the

[3] Hopi Domains, IUPAL 14, supplement to IJAL 23, No. 2 (1957).

trained informant might say *Are the sons and daughters of a man his children?* Here we obtain a second new sentence which, however, (a) exemplifies contrastive syntax (from the original sentence taken as standard of reference), and which is also (b) different in respect to the possibilities of transposition of the permutants and indeed in respect to the segmenting of the permutants themselves. Thus, permutant Z of the original sentence (*are his children*) has now to be segmented into two permutants, with additional allo-permutants in the interrogative sentence; having segmented the new permutant *are* (with allo-permutant *are they*), such non-contrastive syntactic variations may be elicited as *The sons and daughters of a man, are they his children?*

Contrastive syntax as that which marks interrogativeness in English is in one sense coordinate with contrastive morphology (but same syntax) as that which marks number in English; both would be identifiable in an extensive collection of texts, just as phonemic contrasts (distinctive features) would be identifiable from extensive tape recordings.

Not so instances of non-contrastive syntax—we cannot presume that the possible density range of such instances would show up in the usual text collections.

3.0. When abundant texts have been collected in a given language, the text corpus may show so few instances of non-contrastive syntax that the possibility of transpositional variability in the language might not be supposed were it not for overheard snatches of conversation which, though not recorded, suggest the existence of non-contrastive syntax. We can suppose, in general, that all the world's languages include some possibility of transpositional variability without grammatical contrasts resulting; and at the same time entertain three or four disagreeing views as to the worth or purpose of eliciting or typologizing non-contrastive syntax: that such syntax is trivial (**3.1**); that it reflects stylistic indices (**3.2**); that it influences the shape of successive utterances, and is thereby relevant to the study of longer discourses (**3.3**); that it is the most accessible index of intralanguage variability (**3.4**).

3.1. Hale suggests (personal communication) that the ultimate sterilization of a transformational grammar would be to rewrite S as a choice (in braces) between any of the non-contrastive orderings—this would be a grammar with only a single rule generating only the sample string and its permutants. We agree, there can be no question of restricting a grammar to non-contrastive syntax. But we are not certain whether we are in agreement on the relevance of such syntax, once it is treated (if indeed it is treated); or if it is considered advantageous to clearly segregate non-contrastive from contrastive syntax. These areas of possible disagreement imply that non-contrastive syntax, if not trivial, is at least relatively uninteresting. These questions are to be treated in a subsequent IJAL paper.

3.2. B. R. Moore and F. M. Voegelin find the distinction between contrastive and non-contrastive syntax interesting enough to specify in a restatement of Pike's tagmemic grammar. This distinction needs also to be related to the much older distinction between obligatory and optional. The lack of the tyranny of language—obligatoriness—is nowhere more noticeable than in non-contrastive syntax, but still not uniquely so. Stated positively, optional selection is possible not only here but elsewhere—e.g., for all choices between near-synonyms, as in such pairs as *Knabe* and *Junge* in German. That is to say, there is much in grammar—possibly even in contrastive syntax—that is optional.

These two oppositional pairs—obligatory vs. optional and contrastive vs. non-contrastive—often intersect; are there languages also in which they run parallel to each other? The discussion of these oppositions can neither be divorced from nor restricted

to a discussion of style in language—which is a large subject.

3.3. In discussing the opposition of contrastive and noncontrastive syntax we have reviewed the areas of possible disagreement, and now give, as our tentative position, a view that is in effect a parodox: to segregate contrastive syntax from non-contrastive, and yet postulate that the latter is discriminative in some systematic way.[4] If nothing is discriminated, then non-contrastive syntax is unrelated to the system of the grammar—**3.1** above; or relevant only to variability within the language community—**3.4** below. If non-contrastive syntax is wholly equatable either to what is optional or else to what approximates a formal criterion for style in language, then old wine is being poured into new bottles. How, then, can one speak of non-contrastive syntax which has power to discriminate? A possible resolution of this paradox is that though non-contrastive syntax is taken to be non-determinative both by informant and analyst in respect to transpositions among permutants in the so-called 'same sentence', it may still be predicted to stimulate differences in a following sentence—progressively, across sentence boundaries.

This seems likely. More importantly, it seems testable. For the present, it is stated as a postulate for Hopi. One would not be inclined to postulate yet another universal for the world's languages even if the test were to show that it works for one language. However, whether all the non-contrastive reorderings of the permutants in the antecedant sentence influence the selection of orderings in the consequent sentence, or some do in some languages, or none do in other languages, the postulate for Hopi seems worth trying out for languages with other resources. Such investigation would be concerned not only with non-contrastive syntax but also with experimental selection reminiscent of free association tests. The latter (since the early days of Carl Jung) can be stated as a postulate that an antecedent word (uttered by the psychologist) will stimulate a subsequent word (uttered by the subject) which reflects non-random selection. If an analogue of the free association test were adapted to non-contrastive selection in the syntax of consequent sentences, unexpected results might follow (unrelated, perhaps, to the postulate stated above for Hopi).

Immediate consequences would be (a) an enlargement of the scope of syntax beyond single sentence length; and (b) an innovation of subject-and-experimentor methods made relevant to discovery procedures.

The scope of syntax is now generally taken to be the sentence. Though discourse analysis—analysis of multisentence utterances—has been put forward by Zellig Harris, the results have contributed more to content than to structural analysis. But if different transpositions of permutants in a given 'same sentence' entail different selections in the following sentence, the results might be stated in terms of structural analysis. The minimum scope of syntax would then be two sentences, the variability of one 'same sentence' determining the variability of a following sentence, irrespective of whether the consequent sentence is uttered by the same or by a different speaker than the antecedent sentence.

3.4. Non-contrastive syntax is one of several dimensions or parameters of variability within a given language. Much of what appears to be synchronically variable is on the borderline between synchrony and diachrony, as for example, the differences in selection or pronunciation between grandparental and grandchild generation. Tape recordings of one age group (and indeed a tape recording of a given individual) may

[4] The developers of this view included Kenneth L. Hale, Bruce R. Moore, A. K. Ramanujan, Florence M. Voegelin, and Max A. Zorn, all of whom I would like to acknowledge as collaborators—despite the remaining areas of disagreement.

show some free variation, but the question remains, of what? Though we look for a single system in the structure of a given language, what we find in the general case is a mixed system of variability. The closely similar and yet quasi-independent sources for this mixture are technical and age or sex usage, literary genre, and status speaking styles within dialects and idiolects. Individuals differ. For example, overlong vowels in Hidatsa appear to be phonemically contrastive for sime informants but in free variation, without contrast, for other informants in the transcriptions made by Harris and Voegelin; later Robinett found a stylistic correlate for the phonemic overlong, while in another style of speaking she found that long vowels appear as free variants of overlong vowels.[5]

For non-contrastive syntax the same speaker can be asked to transpose permutants and further asked to identify speakers or situations in which one order is preferred over another, thereby leading rather directly to the quasi-independent source of the variability (as above: usage, genre style, and status style as adapted to dialect-idiolect). These sources reflect considerable variability beyond non-contrastive syntax (e.g. in phonology). But one cannot ask an informant whether he will vary his pronunciation (e.g. of *umbrella*) as readily as one can ask him whether he can vary the order of permutants. (*My umbrella is wet now. Now my umbrella is wet.*) We know that playbacks from tape recordings of two versions of non-contrastive phonology—free variations in phonemics and in morphophonemics—are sometimes heard as 'the same' by informants. The order of morphemic constituents within a word is in general invariable. That leaves non-contrastive syntax as the only free variable in language that is as perceptible to the native speaker as to the analyst.

[5] Florence M. Robinett, Hidatsa I, II, III, IJAL 21 (1955), with references to the earlier work in Hidatsa.

4.0. The chief difference between typologizing and structuralizing a particular language (L) lies in the value and purpose ascribed to exhaustiveness—low for typology, high for structural analysis.

4.1. Most objections to the kind of typology which states comparability between L_1 and L_2 (possibly unrelated) are of a kind which are applicable also to the usual statements in structural linguistics about one language. Accordingly, these objections are also applicable to the comparison of related structures by the comparative method.

Closely similar presuppositions animate work in typology no less than in structural linguistics—synchronically with one language or more than one; or diachronically with two or more languages. Most on-going work presupposes (but without serious demonstration) that there exists a single monolithic structure for each L. This single structure may be termed—for purposes of presentation—successive systems, or sets of subsystems, or coexistent systems, levels and the like.[6]

Linguists, in their characteristic stance, face away from the variability actually occurring in every given L; their enabling devices for doing this are:

LABELS (e.g., variability = *parole*; singleness of system = *langue*);

FREQUENCY-GUESSING (anything from the 'preponderant' to the 'overwhelmingly preponderant' is taken to be representative of a given L);

FICTION OF THE IDIOLECT (singleness of system = one idiolect; variability = the inter-influences among idiolects, each of which is presumed to be amenable to separate description).

[6] The variability of a language as a whole is taken here to be in respect to one subsystem at a time. To typologize such intralanguage variability is to obtain comparabilities in density ranges of each subsystem among a set of languages, irrespective of their descent from a proto-language—but not excluding the possibility of typologizing closely related languages.

The last device, the use of idiolect fiction, is most commonly encountered in anthropological linguistics. Single informants are sometimes necessary because they are last remaining speakers or because only one informant at a time can be imported to universities for field methods classes; but, when choice of one or more informants is possible, as is usually the case in field work, single informants are often used to minimize the variability associated with different speakers in the same speech community. Some variability still remains, even when the corpus is limited to utterances from one informant. The idiolect fiction then serves to reduce the actual variability of the one informant's utterances. For example, the following successive choices were made in an unpublished Ph.D. thesis problem concerned with the description of one American Indian language, spoken in many far flung dialects. First, the scope was narrowed to one dialect. Next, one speaker of the dialect chosen was selected to give all the data utilized in the description. Finally, since the speaker chosen turned out to be influenced by other idiolects than her own, utterances in her supposedly real idiolect were included in the descriptions, while other utterances which were judged—in some unstated way—to be idiolectically non-integrated (disturbing to the desired singleness of structure) were excluded from the description.

This ruthless method of selecting one standard is apparently new but is really the inverse of a very old method. In the classical tradition, non-casual literary texts were taken as the proper standard of grammars, with casual utterances excluded or treated as deviations from the single system, and thereby kept apart from the real structure.

4.2. Doubts about the feasibility of keeping casual verbal art apart from written literary art are met with in folkloristic scholarship whose progress shows increasingly the influence of unwritten or anonymous folk literature and folk song on specifically authored literature; and *vice versa*. Normative standards of correctness or of excellence tremble before such acknowledgment of variability in literature at all levels.

That some willingness to face toward rather than away from variability is also emerging in modern linguistics is shown by such new interests as:

SPECTROGRAPHS (and other ways of recording and manipulating sounds mechanically);

STATISTICS, RATIOS, QUANTIFICATION in general (in stylistic, typological and structural work);

DENSITY RANGES (in typology);

UNIFIED STRUCTURE (in structural analysis).[7]

4.3. The only objection to typology which is not also applicable to structural linguistics and the comparative method is that which claims, for example, that the comparability of noun class in L_1 to noun class in L_2 is not a consequence of comparing two systems but an accidental result of the non-systematic fact that noun classification may be applied to words which (extralinguistically) mark 'things' in many languages, including L_1 and L_2; and that therefore the assertion that noun in L_1 is comparable to noun in L_2 has nothing to do with L_1 and L_2 *qua* formal systems. Convergence in referential meaning, if true, is trivial (extrasystemic).

This objection can be answered by ascribing different labels to L_1 and to L_2 for all the structural form classes (or word classes), as distinguished by the peculiar and particular morphological class cleavage functions or syntactic functions in each separate language. Thus, A_1 can be used as the L_1 label for actor of transitive verb, A_2 for actor of

[7] Compare the approach to Hopi followed by Whorf—structure stated for Toreva dialect (and derived chiefly from one informant); from the vantage point of this dialect, Third Mesa Hopi appears to be a deviant or simplified variant of Toreva Hopi—and the approach to Hopi followed by us, *in* Thomas A. Sebeok (ed.), Style in Language (Casual and Non-Casual Utterances Within Unified Structure).

intransitive verb, and so on. In L_2 on the other hand, X_1 can be used as the label for subject of active verb, X_2 for subject of stative verb, and so on. Since all A's in L_1 function as actors and all X's in L_2 function as subjects (equivalent to actors), there is functional equivalence of A's and X's in respect to verbs; and also partial overlap in verbs which have differently extending functions. Then the A's of L_1 can be equated to or translated as NOUN; and the X's of L_2 can likewise be relabeled NOUN (with nouns defined as filling actor slot).

This is, on the one hand, not unlike conventional translation procedure between two languages. If two languages can be translated, they can also be related to each other typologically.

But if NOUN is not the only form class extracted from L_1 and L_2—if all other form classes of L_1 and all of L_2 are extracted and compared—then typology thereby attains a more systematic dimension of comparability than does ordinary translation.

Typology attains its own kind of exhaustiveness, as above—the inventory of all form classes; and from Trubetzskoy on in phonology—the inventory of all phonemes; and so also in syntax—as the possibility of inventorizing the structure of single languages is developed, the inventories may be typologized for comparability between languages (e.g. major and minor sentence types, word-order typology, kernel sentences and their transformations, sentence profiles and their permutants).[8]

5.0. The examples of Hopi sentence profiles which follow include (a) two kinds of gloss and (b) smooth or final translation; this information—(a) and (b)—was not needed for the English exemplification of *The sons and daughters of a man. . . .* The permutants segmented for the English example were obtained with informant approval—other transpositions were proposed but not accepted by informants. The Hopi sentences cited were transcribed from tape recordings of non-directed utterances. Two successive tasks remain—first, to elicit approval for transpositions among tentative permutants (meaning by 'tentative' the segmentation of permutants before informant approval has been obtained); and second, to set up experiments involving an appropriate sample of Hopi speakers in order to explore how variations in non-contrastive syntax of a given sentence (the ANTECEDENT) may affect a following sentence (the CONSEQUENT).

We distinguish here between eliciting from informants and experimenting with informants. The history of science is a long one, but experimentation, as a characteristic way of science, is surprisingly modern—expectable or taken for granted not much before two centuries ago. In laboratory linguistics experimentation is essential to demonstrate what is postulated—e.g. in speech synthesizing. In psycholinguistics the relevance of experimentation to what is postulated is still uncertain—e.g. in the Humboldt-Sapir-Whorf hypothesis of Weltanschauung. In anthropological linguistics eliciting supplements the corpus of non-directive texts—sentences or longer discourses—and whatever linguistic structure is discovered thereby or may be (under the monolithic presupposition) derived from the utterances of one informant; additional or multiple informants, as noted above, contribute to the problem of variability within a given language. Experimentation—in the sense of setting up a control or playback frame to which a sample of speakers would be expected to react differently in terms of morpheme selection but the same in terms of sentence profile arrangement within a given selection—now seems possible for exploring

[8] But the difference between typology and structure remains in respect to exhaustiveness (4.0)—for typology, if systematic (and, if not, the typology is objectionable), the exhaustiveness extends to taking into account the entire inventory of a subsystem; in contrast, structural analysis begins with such inventories for each level.

discrimination of consequent sentences after different transpositions of the antecedent sentence. Something like this has been suggested for the phonemic pair test (same or different?), but the way in which this is usually discussed suggests that the phonemic distinction tested is guaranteed by the response of a single informant, as in eliciting generally. Experimenting with or obtaining responses from more than a single informant is essential to our syntactic problem.

To begin with, informant approved permutants of the antecedent sentences need to be elicited. The examples which follow are spontaneous or non-directed, and therefore are given only with tentative permutants; the problem is here given in the general shape in which it will be presented to Hopi informants.

The problem is not directly concerned with contrastive syntax, though Hopi does provide examples of this also. The examples below, translated *I'll tell you something* (**5.1**) and *Will you tell me something* (**5.2**) are given (a) to illustrate such contrastive syntax; and (b) to show that the most generalized line of information in the sentence profile—number (1)—liberates the statement from the selection of particular morphemes, which are specified for form class, etc., in line (2), glossed in line (3), translated in line (4), and segmented for tentative permutants in line (5); and (c) to raise the question of how much transposibility is possible in this sentence without affecting the expression formally, without 'suspending' the assertion (as Weinreich uses this term)—or, positively put, with the sentence remaining assertive despite transpositions among the permutants.

Line (1) gives the scatter profile: an uncombined major morpheme (M) followed by major morpheme combined with suffix (Mm), followed by quasi-independent minor morpheme with linkage to the left indicated by preceding hyphen (-m); ending with major morpheme combined with both operator and affix (mMm). This mMm is flanked by non-terminal juncture, /, on one side, by terminal juncture, #, on the other.

Line (2) gives additional or more particular information, largely by substitution. The class of the uncombined M is noun (N); that of Mm is N combined with suffix cited in morph shape (-iy)—N-iy; that of the minor morpheme with unilateral linkage (-m) is particle (P)—the linkage is to a preceding word which includes a major morpheme (Mm); and finally the class of M in mMm is verb (V), combined with reduplication (R) operator and with affix cited in morph shape (-ni)—$\frac{\text{V-ni}}{\text{R}}$.

Line (3) adds two kinds of gloss to the specification in line (2)—grammatical function in parentheses (with abbreviations, a = *actor*, g = *goal*, tr = *transitive*, int = *intentive*) which permits the italicized lexical gloss, as V *tell*, to be cited without raising the question of whether tense (future) or mode (imperative) is distinguished in Hopi by the verbal suffix -ni (the common denominator of the range of possible meanings is *intentive*); an operator, as R, is repeated from line (2) to (3) when no contrast is known, as here where V always appears reduplicated.

Line (4) gives a smooth translation to the two kinds of gloss given in line (3); a more elaborate multiple stage translation is still

5.1.	ni	ʔɨmiy	hi:ta/	ʔa·ʔa·wnani #
(1)	M	Mm	-m/	mMm #
(2)	N	N-iy	P/	$\frac{\text{V-ni}}{\text{R}}$ #
(3)	N(a) *I*	N(g) *you*	P *something*/	$\frac{\text{V(tr, int)}}{\text{R}}$ *tell* #
(4)	"I'll tell you something."			
(5)	Permutants X (*I you*) Y (*something*) Z (*tell*)			

possible in subsequent paragraph commentary on line (4).

Line (5) gives a tentative segmentation of permutants in terms of an abbreviated line (3) notation.

5.2.	ʔim	hí:ta	niy/	ʔa·ʔa·wnani//
(1)	M	m-	Mm/	mMm//
(2)	N	$\frac{\text{P}}{\text{CO}}$	N-iy/	$\frac{\text{V-ni}}{\text{R}}$ $\frac{//}{\text{Sp}}$
(3)	N(a) *you*	$\frac{\text{P } \textit{something}}{\text{(intrg)}}$	N(g) *me*/	$\frac{\text{V(tr, int)}}{\text{R}}$ *tell* $\frac{//}{\text{(intrg)}}$
(4)	"Will you tell me something?"			
(5)	Permutants X (*you something me*) Z (*tell*)			

Line (1) in **5.2** differs from line (1) in **5.1** in final juncture (non-falling terminal juncture, //, rather than falling tone juncture, #) and in the relative order and direction of linkage of the quasi-independent word—symbolized by -m in **5.1** (M Mm -m) to show that the linkage is to a preceding word, but symbolized by m- in **5.2** (M m- Mm) to show that the linkage is to a following word.

Line (2) in **5.2** differs from line (2) in **5.1**, which is taken as a standard of assertive reference, by the addition of two operators—CO (syntactically, contrastive order) under particle (P) and Sp (suppletive replacement of // for # in the standard of reference).

Line (3) in **5.2** differs from line (3) in **5.1** by the additional gloss for CO under P and for Sp under //. In both cases, intrg = *interrogativeness*. That is to say, the interrogative mode is analyzed as being marked redundantly.

The smooth translation of line (4) is assertive in **5.1** but interrogative in **5.2**.

The tentative permutants of line (5) in **5.2** are fewer than those in **5.1** because the transposable permutant Y in **5.1** is non-transposable when included in permutant X in **5.2**—that is, for possibilities of transposition in non-contrastive syntax.

A STATISTICAL MORPHO-SYNTACTIC TYPOLOGY STUDY OF COLORADO (CHIBCHA)

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0. Introduction
1. Typological model used
1.1. Theory
1.2. Technique of annotation
2. Typological statements about Colorado
3.1. Comparison between speech varieties within Colorado
3.2. Comparison with Cayapa, a related language
3.3. Comparison with Spanish, an unrelated language
3.4. Comparison with translated Colorado material

0. The aim of this paper is to apply one aspect of density range typology—sentence profile—to the comparison of Colorado[1] texts (1) among themselves according to non-linguistically affected speech varieties, (2) with Cayapa, a closely related language, (3) with Spanish, an unrelated language, and (4) with texts translated into Colorado by a foreign speaker. This latter point will be given special attention as a possible technique for measuring the smoothness of a translation.

For this study two hundred sentences, comprising ten units, of native-spoken Colorado text were used. These include eight units of twenty sentences each from eight texts, one unit composed of three sequences with a combined total of twenty sentences, and one unit of twenty isolated sentences overheard in Colorado conversations. All is spontaneous material. In addition, two units of twenty sentences each of Spanish and Cayapa were used, and two units of twenty sentences each of Colorado translated by a foreign speaker.

1.1. The typology used is an adaptation of one developed in C. F. Voegelin's Languages of the World lectures at Indiana University (1960–61).

As a preliminary, morphemes are divided into two groups, major and minor. Major morphemes are stems and monomorphemic free forms. Minor morphemes are affixes and affix-like morphological OPERATORS such as reduplication, suppletion, morphemic nasalization, and the like.

Each of these groups is then sub-divided, the major morphemes into stem classes (such as nouns and verbs[2]) and minor morphemes into bound or dependent affixes and operators (and quasi-independent words not treated in this paper).

By using this grouping and sub-grouping (which, under various names, has virtually universal recognition in structural work) a typology is arrived at in which statements are made at more than one graded level of detail, both in morphology and in syntax. In this paper, however, only two degrees of detail of description are used.

The morphological part of this study deals

[1] Colorado is a Chibchan language, classified by Rivet and Jijón y Camaaño as Barbacoan, spoken by approximately six hundred Indians in the coastal jungles of Ecuador. The Colorado material for this study was gathered on field trips during the years 1956–60 under the auspices of the Summer Institute of Linguistics.

[2] The problem of comparability of stem classes across languages is fundamental to any question of morphological typology, but treatment of it is beyond the scope of this paper. In practice there is little problem in equating a verb in one language with a verb in another on a functional basis; whether or not this brings in meaning (or, indeed, whether we should even attempt to avoid class meaning at this point) is another question.

For Spanish I have arbitrarily identified nouns as that class occuring with -s pluralizer, which includes adjectives, articles, and demonstratives

with the occurrence of major morphemes with minor morphemes. (The process, or operator, of compounding[3] two major morphemes is in itself considered to be a minor morpheme.) First, at the most general level of description, the mutual distribution of major and minor morphemes is considered, with no differentiation of major morphemes into stem classes or minor morphemes into form classes (prefixes, suffixes, etc.). This is done in two ways, by comparing the number of words in which major morphemes are combined with minor morphemes and those in which they do not so combine; and by comparing the total major morpheme count with the total minor morpheme count. This yields the most general typological statements and should be particularly useful for broad comparisons between languages.

Ratios are then calculated with major and minor morphemes broken down into their respective sub-groups, major morphemes into stem classes and minor morphemes into form classes. Statements at this level give prefixes per verb, prefixes per noun, suffixes per verb, and so on, and should be useful especially for comparisons between languages of the same family, between variations within a language, and for more detailed comparisons between unrelated languages.

The syntactic part of this paper deals with the distribution of major morphemes only. These morphemes are considered first as an undifferentiated class and then broken down into specific classes. With major morphemes undifferentiated as to stem class, the ratio of major morphemes per sentence is the basic figure to be isolated. Where it is possible to identify a phrase unit objectively, it may also be useful to give the ratio of major morpheme to phrase and phrase to sentence. Because of the difficulty of defining a phrase comparably for two of the languages treated in this study, phrase units are included for consideration only in the Colorado material.

The detailed syntactic statements give the percentages of major morphemes which are members of each particular stem class.

In summary, there are two levels of complexity of description, general (major vs. minor morphemes) and detailed (morphological classes such as nouns, verbs, prefixes, and suffixes). A ratio calculation may be made on either of these levels; a less rewarding ratio involving mixed levels has also been attempted.[4]

1.2. Sentence profile is the descriptive technique used, and it is used as follows: On the first line below the text an M is written for each major morpheme of the text, and along with it a numeral indicating the number of minor morphemes with which it is combined. Thus, a word with a stem, a suffix, and a prefix would be marked M-2. The following sample sentence is marked as having one word with a single major morpheme, one word with a major morpheme and a minor morpheme, and one word with a major morpheme and four minor morphemes. Hyphens in the text separate affixual morphemes.

la	yá-ka	mą-hí-na-yo-ʔe
M	M-1	M-4

This is the general level of description, and below this[5] is written a line with the detailed

[3] These compounds do not include constructions of the type referred to as idioms in the article On Linguistic Primes, by F. Householder, Word 15.231. These historically-fused 'idioms' are treated here as though they were monomorphemic because (1) they are distributed as such in their combinatorial possibilities, and (2) information on 'idioms' in Cayapa and Spanish is not immediately available.

[4] Ratios of undifferentiated minor morphemes per noun, per verb, etc., and the ratio of prefixes, suffixes, etc. per undifferentiated major morpheme were calculated for all the data used in this study, but the calculation was then abandoned because in no case did it appear to add anything of value or tell anything not already clear from other ratios.

[5] The actual mechanical layout of the description is not vital to the principles involved, and the layout I have used is an adaptation of one of several demonstrated at Indiana University. See section **1.1** above, and C. F. Voegelin, Density Range Typology II: Contrastive and Non-contrastive Syntax, IJAL 27.287–297.

description. The stem classes are noted by abbreviation (N-noun, V-verb, P-particle), along with symbols identifying the individual types of non-stem morphemes: a number following a hyphen for suffixes, a number preceding a hyphen for prefixes, and a number following a slant line for operators. Thus, in the sample sentence, as further annotated below, the first word is a noun without affixation, the second word is a noun stem with one suffix, and the third is a verb stem with one prefix and three suffixes.

nuwí	fe-ká-ri	
M	M-2	
P	V-2	
where	*arrive-particpl*(431)-*only*(846)	

How far (until arriving at where) are you going?

la	yá-ka	mą-hí-na-yo-ʔe
M	M-1	M-4
N	N-1	1-V-3

One further line of even more detailed information is then added in a sentence profile description: a morpheme-by-morpheme gloss. If the minor morpheme inventory is large, identification of the minor morphemes by a reference number is also helpful. (Although less than a score of minor morphemes are used in the Colorado examples cited in this paper, reference numbers for them are included because of their usefulness in dealing with the 200-sentence corpus as a whole.) On this line hyphens mark morpheme boundaries and parentheses inclose the reference numbers of minor morphemes. Thus, the notation *house-goal* (612) in the exposition below of the sample sentence indicates that the major morpheme means *house* and that the minor morpheme is number 612, meaning *goal*. If two English words are needed to gloss a single Colorado morpheme they are separated by space.

In addition to these morphological annotations, phrase divisions are marked by vertical lines in Colorado material. Below all this is a free translation, so that the entire sentence profile description for the sample sentence above is:

1a	yá-ka	mą-hí-na-yo-ʔe
M	M-1	M-4
N	N-1	1-V-3
I	*house-goal* (612)	*again*(926)-*go-contin*(238)-*pers*(233)-*declar*(101)

I am going to my house again.

The following are three additional samples of sentence profile description. These sentences are taken from three different texts in the corpus.

	hí-na-yų
	M-3
	V-2/1
	go-contin(238)-*personal*(233)-*interrog*(103)

Suffix 233, *personal*, occurring in both of the above sentences, marks first person in declarative sentences and second person in interrogative sentences. The interrogative morpheme in this sentence is an operator, nasalization of the final syllable; and yu is a variant form of yo conditioned by the nasalization.

From the sentence profile information for all sentences, the general and detailed ratios referred to in section **1.1** were computed for each of the fourteen units of twenty sentences. Of the eleven morphological ratios, two were general (the polymorphemic word ratio and the ratio of minor morphemes to major morphemes) and nine were detailed (the ratios of prefixes, suffixes, and operators to each of the stem classes). The six syntactic ratios include three general (words per sentence and, for Colorado, words per phrase and phrases per sentence) and three detailed (percentages of nouns, verbs, and particles). All ratios are calculated for complete units of twenty sentences rather than for individual sentences.

2. Within the ten units of native-spoken Colorado text, the most strikingly regular of all seventeen ratios is that of polymorphemic

words to total words. At one extreme is a unit with 60.6% of all words polymorphemic, and, at the other extreme, two units with 69.5% polymorphemic words. This is a range of less than 9%. The ratio of total minor morphemes to total major morphemes showed a little wider range, from .90 in one unit to 1.26 in another.

kasalé-ri	kasalé-ri	mą́-ka	ke-ʔé	kurú-ka	foró-bi
M-1	M-1	M-1	M-1	M-1	M-1
P-1	P-1	N-1	V-1	N-1	N-1
first-only	*first-only*	*one-genrl*	*do-declar*	*agouti-goal*	*hole-in*(610)
(846)	(846)	(721)	(101)	(612)	

First he got one agouti into a hole.

nuwí	ka'có-to	ʔamána	mą-pa'tá-yų
M	M-1	M	M-3
P	V-1	N	1-V-1/1
where	*sleep-subord.complet*(342)	*today*	*again*(926)-*descend-personal*(233)-*interrog*(103)

Where did you sleep before you came down today?

The detailed ratios showed an interesting pattern. Of all minor morphemes, suffixes occur most on each stem class, and, among the various stem classes, verbs occur with the most per stem of every kind of minor morpheme. Colorado, then, could be described as a predominantly suffixing language, with verbs morphologically most prominent.

The average number of suffixes per verb varies from 1.28 to 1.78 among the ten units. Suffixes per noun vary from .38 to .79 and per particle[6] from zero to .28. Prefixes occur much less frequently, averaging from zero to .29 per verb, zero to .07 per noun, and not occurring at all with particles. Operators are similar in distribution to prefixes, the average ranging from .02 to .29 per verb, zero to .06 per noun, and none with particles.

The average number of words per sentence[7] in Colorado ranges from 3.4 in one unit of twenty sentences to 7.4 in two others. The 3.4 average is for the unit composed of single sentence texts copied on the spot from live conversations, and these are shorter simply because longer utterances were harder to remember long enough to write down. Excluding these one-sentence texts, the shortest average sentence length was 4.0. Average words per phrase ranged from 1.2 to 1.6, and phrases per sentence from 2.6 to 5.2. Verbs averaged from 39% to 53% of the total major morphemes, nouns from 37% to 47%, and particles from 6% to 20%.

Syntactically, then, we may summarize Colorado as a language in which sentences tend to be four to seven words long (although one-word sentences do occur, as well as sentences of twenty words or more), phrases tend to be quite short, and particles play little part as compared to nouns and verbs.

All ratios for each unit of twenty sentences, as well as for all of the native-spoken Colorado texts taken together, are tabulated in chart 1. Chart 2 gives the data from which the ratios were calculated.

3.1. Some correlations can be shown between various statistical differences in the

[6] Some suffixes in Colorado may occur with any stem class, so that it is impractical to define particles as uninflected stems here. Colorado particles are, then, defined as those stems which occur with these universal suffixes only.

[7] The sentence for Colorado was defined by both morphological criteria (suffixes which mark verbs as independent or dependent) and by phonological criteria (terminal juncture). Sentence breaks in the Cayapa and Spanish texts were marked when I received the material, and I followed that marking.

CHART 1. Tabulation of Ratios

	Unit number	Polymorphemic word ratio	Minor Mphms per major morpheme	Prefixes per noun	Suffixes per noun	Operators per noun	Prefixes per verb	Suffixes per verb	Operators per verb	Suffixes per part.	Operators per part.	Words per sentence	Words per phrase	Phrases per sentence	Noun percentage	Verb percentage	Particle percentage
Individual Colorado Units of Twenty Sentences Each	1.	.695	1.16	.03	.788	.015	.086	1.78	.124	.078	0	7.40	1.43	5.20	.445	.390	.165
	2.	.695	1.36	.07	.428	0	.145	1.59	.285	0	0	3.95	1.52	2.60	.356	.532	.112
	3.	.628	1.09	0	.400	0	.146	1.57	.232	0	0	7.40	1.63	4.55	.438	.466	.106
	4.	.606	.95	0	.396	.063	.163	1.56	.204	.067	0	5.35	1.23	4.35	.450	.405	.145
	5.	.640	1.02	0	.479	0	0	1.55	.227	.200	0	5.00	1.67	3.00	.460	.440	.100
	6.	.648	.90	0	.557	0	.285	1.28	.024	.277	0	5.70	1.32	4.30	.473	.368	.159
	7.	.663	1.08	0	.704	0	.114	1.61	.136	.100	0	5.05	1.63	3.10	.365	.436	.199
	8.	.619	1.00	0	.382	0	.143	1.73	.024	.077	0	4.85	1.41	3.45	.433	.433	.134
	9.	.657	.96	0	.522	.020	.150	1.28	.224	0	0	4.80	1.60	3.00	.521	.417	.062
	10.	.680	1.11	0	.517	.032	.218	1.34	.280	0	0	3.40	1.44	2.35	.456	.470	.074
All native-spoken Colorado together		.652	1.05	.009	.522	.013	.155	1.55	.173	.097	0	5.29	1.46	3.61	.441	.429	.130
Translated Colorado																	
Unit	A.	.533	.95	0	.31	.072	.053	1.76	.316	.04	0	5.15	1.61	2.45	.407	.368	.225
Unit	B.	.542	1.16	0	.25	.021	.034	2.00	.250	0	0	4.15	2.02	2.05	.576	.386	.038
Cayapa		.466	.63	0	.22	0	0	1.17	.413	0	0	4.60			.316	.588	.096
Spanish		.575	.70	0	.33	.349	0	1.20	.146	0	.028	7.50			.480	.276	.244

CHART 2. Morpheme and Word Counts

	Unit number	Total words	Polymorphemic words	Minor morphemes	Nouns	Noun prefixes	Noun suffixes	Noun operators	Verbs	Verb prefixes	Verb suffixes	Verb operators	Particles	Particle suffixes	Particle Operators
Individual Colorado Units of Twenty Sentences Each	1.	148	103	172	66	2	52	1	58	5	103	7	24	2	0
	2.	79	55	99	28	2	12	0	42	6	67	12	9	0	0
	3.	148	93	151	65	0	26	0	69	10	109	16	14	0	0
	4.	107	65	102	48	0	19	3	43	7	67	8	15	1	0
	5.	100	64	102	46	0	22	0	44	0	68	10	10	2	0
	6.	114	74	102	54	0	30	0	42	12	54	1	18	5	0
	7.	101	67	109	37	0	25	0	44	5	71	6	20	2	0
	8.	97	60	97	42	0	16	0	42	6	73	1	13	1	0
	9.	96	63	92	50	0	26	1	40	6	51	9	6	0	0
	10.	68	46	76	31	0	16	1	32	7	43	9	5	0	0
		1058	690	1112	468	4	244	6	456	64	706	79	134	13	0
All native-spoken Colorado together Translated Colorado															
Unit	A.	103	55	98	42	0	13	3	38	2	67	12	23	1	0
Unit	B.	83	45	96	48	0	12	1	32	1	64	8	3	0	0
Cayapa		92	41	58	54	0	12	0	29	0	34	12	9	0	0
Spanish		150	88	105	72	0	24	25	41	0	49	6	36	0	1

texts and three non-linguistic factors: emotional state (calm vs. excited), trade language influence, and speech style (conversation, narration of current events, and narration of folk stories).

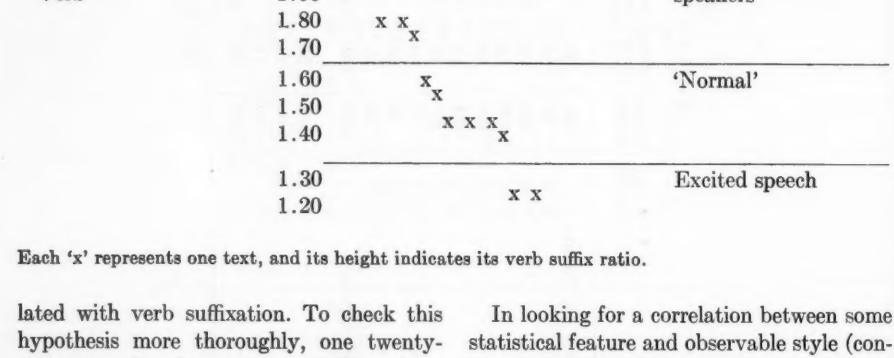
Emotional state correlates with verb suffixation. Of the ten units, two are definitely excited speech, seven are not, and one—the one comprised of twenty single-sentence texts—is too varied in content to be included in this consideration. The verb suffixation ratios for calm speech range from 1.55 to 1.78, while the excited speech texts each average 1.28.

Strangely enough, one of these excited speech texts (the most extreme) has the largest ratio of affixation per particle of any of the ten units (2.8, vs. a range of from zero to 2.0 for the other units). This appears to be mainly from an excited usage of suffixes 846 and 847, which may be added to any noun or particle for emphasis.

Trade language influence is also correlated with verb suffixation. To check this hypothesis more thoroughly, one twenty-sentence unit—the sequence of three short texts by different speakers—was broken down and the suffix-per-verb ratios calculated for each part. Also, the ratio of verb suffixation for the foreign-speaker's texts were included here. All together, this gave a total of thirteen texts. Of these, five texts were by four speakers with great contact with Spanish: the foreign speaker, two Colorados who were raised outside the tribe in Spanish-speaking homes, and one man who is extremely acculturated to Ecuadorian culture, and has Spanish-speaking friends. The other eight texts are by eight speakers, all of whom have had much less contact with Spanish. The suffix-per-verb ratios for the five texts by Spanish-influenced speakers are 1.76, 1.78, 1.78, 1.94, and 2.00. For the other eight texts the ratios are 1.28, 1.28, 1.45, 1.55, 1.56, 1.57, 1.59, and 1.61. Notice that, except for the excited speech texts and one other (by a child), these ratios fall within a range of only .06. It would be interesting to obtain figures for a Spanish-influenced speaker who was also excited to see how the two factors affect each other, but no such text is available.

The Graph of Verb Suffix Ratios illustrates the correlation of verb suffixation with emotional state and influence of Spanish, the trade language.

Graph of Verb Suffix Ratios



Each 'x' represents one text, and its height indicates its verb suffix ratio.

In looking for a correlation between some statistical feature and observable style (conversation, narration of current events, and narration of folk stories), the most significant feature found was the number of words per sentence, stories having the most and conversation the least. Of the ten units, three are mixed as to style, two are stories, four are reports of incidents, and one is a conversation. Each of the two stories averages 7.4

words per sentence, the reports of current events range from 4.8 to 5.7, and the conversation only 4.0. This appears to be a rather definite correlation, even though based on admittedly brief data.

But if the stylistically-mixed units are broken down and investigated, some recalcitrant evidence appears. One mixed unit, the group of twenty isolated sentences, must again be omitted entirely because of the great variety of content. But of the other two units, number 8 contains three bits of conversation and number 5 starts with four sentences of conversation, then goes into a story. Three of these four conversation texts have low word-per-sentence ratios, but in one conversation the speaker rambles on through forty words in a mere five sentences. The story fragment is also a problem, as it averages only 5.3 words per sentence, far below the 7.4 average of the other story texts. All in all, the evidence suggests a correlation between the number of words per sentence and style, but this is as yet far from conclusive.

In summary, the morpho-syntactic feature which has the clearest correlation with non-linguistic factors is the ratio of verb suffixation, but some evidence suggests that the number of words per sentence may also be correlated with some non-linguistic factors.

3.2. Having considered the statistical profile of Colorado and some of the variations within that language, we will compare Colorado with Cayapa[8] on the basis of these statistics. Following is a sample sentence from the Cayapa text, with a sentence profile description:

en-sa	ka·	na?ama	loro	pala	me·-mi
M-1	M	M	M	M	M-1
N-1	N	N	N	N	V-1
this-object	*small*	*daughter*	*parrot*	*words*	*hear-past indicative*

This little daughter heard the parrot talking.

Cayapa combines morphemes together less than does Colorado. No prefixes at all occur in this Cayapa text, and no minor morphemes occur with particles. Also, no operators occur with nouns. This leaves only noun and verb suffixes and verb operators (compounding only) occurring in this Cayapa text.

As would be expected, a statistical difference between the languages is apparent from even the most general and regular of the ratios, that of polymorphemic words to total words. For Cayapa it is 44.6%, as compared to 60.6% for the lowest of the Colorado units. Verb and noun suffixes occur proportionately less, with only .22 suffixes per noun and 1.17 per verb, both figures being lower than the lowest for any of the Colorado units.

The Cayapa ratio of words per sentence is well within the range of the corresponding Colorado ratios, but it is somewhat below the average for them all together. In the proportions of the various stem classes Cayapa is very close to Colorado, but seems to have a slightly higher proportion of verbs and a little less of nouns and particles. Tabulated data for the Cayapa material are also listed in charts 1 and 2.

It would appear, then, that in the half-millennium since Cayapa and Colorado began to split, there has been a drift toward more use of minor morphemes in Colorado and/or less in Cayapa, a greater emphasis on verb forms in Cayapa, and little or no change in number of words per sentence.

3.3. Spanish is included in this sentence profile comparison in order to compare Colorado with a totally unrelated language and to compare three languages among themselves. The twenty sentences used were

[8] Cayapa is a Chibchan language very closely related to Colorado, spoken by a few thousand Indians in the coastal jungles of Ecuador. Preliminary lexico-statistic calculations place the divergence date for the two languages at about 1500 AD. I am indebted to O. Carl Brown for the provision of the Cayapa text, one which he transcribed on a field trip to Ecuador in 1955.

taken, in sequence, beginning at a random point, from the play 'Marianela,' by Benito Pérez.[9] In the counting of verb suffix morphemes I have followed the analysis of Sol Saporta in his article, Spanish Person Markers, Language 35.612 (1959). A sample sentence from this text, with sentence profile description, is:

¿Cómo	ahora	no	quier-e-s	viv-ir?
M	M	M	M-2	M-1
P	P	P	V-2	V-1
how	*now*	*not*	*want-pres.-2ps*	*live-infinitive*

How is it that now you don't want to live?

The value of typological comparison at more than one level of detail stands out in sharp relief when Spanish is compared with the two Chibchan languages, Colorado and Cayapa. At the most general level the picture of Spanish is that of a language quite similar to both Colorado and Cayapa and somewhere between them typologically. The ratio of polymorphemic words to total words is 57.5%, putting it between Cayapa (44.6%) and the lowest for Colorado (60.6%). The ratio of total minor morphemes to major morphemes gives a similar picture, .70 for Spanish, .63 for Cayapa, and from .90 to 1.26 for Colorado.

In this case a general typological statement highlights similarities, but there are, in fact, great typological differences between Spanish and these two Chibchan languages. At the detailed level of morpho-syntactic description, particles are seen to be much more prominent in Spanish, nouns less so. In Spanish, particles accounted for 24% of all stems, as contrasted to an average of 13% in Colorado; while nouns constitute 43% of Colorado stems, but only 28% of Spanish. The detailed level of description also shows great differences in operator morphemes. In Colorado there is nasalization and compounding, and in Cayapa there is compounding alone; but Spanish operators are principally suppletion and the interchange of members of paradigmatic sets. And in addition to this significant difference in kind between operators in Spanish and the Chibchan languages, the per-stem count of operators is much higher for Spanish. In the light of these statements made at the more detailed level, then, Spanish is seen to differ from both Chibchan languages in that it makes much greater use of one kind of major morpheme, the particle, and of one kind of minor morpheme, the operator.

Statistics for the Spanish text are also given in charts 1 and 2.

3.4. In this section the native-spoken Colorado text will be compared typologically with texts translated into Colorado by a foreign speaker (myself).

In translation out of one's native language, any translator with adequate training or natural aptitude will be careful that all of his constructions in the target language are grammatically possible. But experience has shown that it is possible to be completely grammatical and yet sound foreign by over-using certain constructions used only rarely by native speakers or by too infrequent use of certain common expressions. I believe that a quick typological check of translated material against native-spoken text (or native-written text if available) can be a useful tool in checking on such misuses of a target language. This comparison is an attempt to do such a typology-based check.

Two texts were used, and a unit of twenty sentences was again abstracted from each of them. The texts were translated in early 1958 and late 1959. A sample sentence from the translated texts, with sentence profile description, is:

[9] Eduardo Julia Martínez (ed.), Teatro Moderno. Madrid: Consejo Superior de Investigaciones Cientificas, Instituto de Antonio de Nebrija, 1947, p. 125.

hų́-ci	kí-ʔa-na-ʔe	pi	keló-le
M-1	M-3	M	M-1
N-1	V-3	N	N-1
that-toward(620)	*do-1st.prs.fut*(208)-*contin*(238)-*declar*(101)	*water*	*near-locat*(636)

I'll make it over there near the river.

The most constant of the general typological ratios, the polymorphemic word ratio, immediately brands the texts as foreign. They contain 53.3% and 54.2% polymorphemic words, well below the range for native-spoken Colorado. The proportion of total minor morphemes per major morpheme is within permitted boundaries, but within individual stem classes there are some wide deviations from the Colorado norm. Noun suffix ratios for both units of translated text are below the lowest for native-spoken material. Verb suffixation ratios tend to err in the other direction, with one unit of translated text almost as high (1.76) as the highest for the native-spoken corpus and the other well above the highest (2.00). Syntactically, the translated material also exhibits some deviations from attested Colorado ratios, the most clear case of which involves grouping of words into phrases. In one unit the ratio of words to phrases is higher (2.0) than in native-spoken Colorado; but the ratio of phrases to sentences is correspondingly lower (also 2.0) so that the number of words per sentence is within the Colorado range, the two errors having obscured each other.

The other unit of translated text has a very slight overusage of particles. They constitute 22.5% of the stems, while in native Colorado material they range from 6.2% to 21.7%.

The ratios and raw data for the translated material are also tabulated in charts 1 and 2.

With the preceding statistics and a general knowledge of Colorado the following conclusions can be drawn concerning the translated texts: There was a tendency to modify nouns by excessive combination with free forms and to modify verbs excessively by long sequences of suffixes. This resulted directly in the too-high ratios of verb suffixes and operators to stems and in the too-low ratio of noun suffixation. Then, in one text, many of the extra free forms used to modify nouns were particles, resulting in the high particle proportion in that text. The general tendency to put more suffixes on verbs (which normally occur with a minimum of one suffix) and less on nouns resulted in less inflected forms without significant change in the total number of suffixes. This accounts for having a too-low polymorphemic word ratio and yet a total minor-to-major morpheme ratio that was within the range of native Colorado material.

I believe that a translator could apply these conclusions to a translated text to produce a new translation typologically closer to the target language and consequently less foreign sounding.

SUBSTITUTION AND FREQUENCY-ESTIMATION IN LINGUISTIC ANALYSIS[1]

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0. Criteria of substitution AND frequency
0.1. Two axioms (concept, operation)
0.2. Identity theorem
1. Morphemic and syntactic vs. phonemic analysis
2. Substitution as a criterion
3. Frequency-guesses, substitution, and morphemic analysis
4. Substitution
5. Pool of examples
6. Replicable substitution
7. The 'ease of statement' criterion
8. Non-replicable basis of decision
9. Efficiency of statement
10. Evaluation of Harris' Methods
11. Logical consistency and inconsistency
12. Classes of morphemes, and of morphs
13. Mutual implication vs. circularity
14. Over-view
15. Evaluation of Wells' IC analysis
16. Criterion for triviality
17. Utility of substitution
18. Grammaticalness
19. Expansion
20. Actor-action sentence type
21. Relative importance in IC analysis
22. Sameness of meaning
23. Homonymous morphemes and constructions
24. Informant's response to homonyms
25. Mechanical procedure and replicability
26. Methods of discovery, unilateral dependence, and circularity

0. Substitution has been widely used as a criterion in linguistic analysis without much attention having been paid to the operations defining it. The use of frequency-estimation as a criterion in linguistic analysis has been subjected to critical scrutiny by Bazell,[2] without, however, falling into disuse.

0.1. The scientific canons in terms of which it is proposed to measure the adequacy of substitution and frequency-estimation are the following axioms:

(A). A concept (or term or device or method), no matter how elegantly it may be defined in utterances of some natural language or other symbolic system, is, for the purposes of science (as opposed to formal systems), no better than the operations prescribed for its empirical interpretation.[3]

(B). An operation (as a means to empirical interpretation of a concept in a theory) is better insofar as it is replicable by an independent investigator, worse insofar as it is not.[4]

0.2. In addition to these generally held axioms, there is a theorem from linguistics itself which will figure in the discussion: the Identity Theorem.[5]

[1] I am indebted to Madison Beeler, C. West Churchman, M. A. Baumhoff and Kelvin Deming for their suggestions concerning earlier drafts of this paper.

[2] C. E. Bazell, The Correspondence Fallacy in Structural Linguistics. Istanbul, 1952, p. 9, ff. It has not been universally recognized that each of these criteria presents grave difficulties and that these difficulties compound each other when the criteria are used together, as they usually are.

The purpose of the present paper is to identify the shortcomings of these analytical devices so that the way may be cleared for the development and introduction of better ones. It is not our purpose here to outline such preferable analytical methods, but simply to show that the present ones are inadequate according to widely accepted scientific canons.

[3] Cf. 'Interpretation of a free variable', W. Quine, Methods of Logic, New York 1950, 196 ff., and S. S. Stevens, 'Psychology and the science of science', Psychological Bulletin 36.221–63 (1939).

[4] G. Bergmann and K. Spence, Operationism and theory in psychology, Psychological Review 48.1–14 (1941), and Stevens, op. cit.

[5] Cf. General Linguistics IV, No. 1 (1959).

1. The shortcomings of traditional morphemic and syntactic analysis have been subjected to vigorous and ingenious attack by numerous recent investigators. Outstanding have been Wells, Pike, Harris, Hockett and Nida, and their students. Nonetheless some serious difficulties remain.

These difficulties are mostly interrelated, though they may be stated as if they were independent: rigor is inferior to that characteristic of recent phonemic analyses; there is neglect of some of the problems involved in replicable use of informants (perhaps because the use of texts has declined in popularity in comparison to 'word-list' eliciting); the analyst's knowledge of the language is admitted 'through the back door' at a stage of analysis when he is 'not supposed' to have such knowledge; substitution-possibilities are used as criteria; there is controversial circularity in distinguishing morphemic from syntactic analysis. All these difficulties are different statements of essentially the same proposition: the strides of contemporary linguists in developing a replicable (or behavioristic or rigorous or mechanistic) analysis have been far greater for the phonemes of a language than for its larger combinations of phonemes.

2. The criterion of 'substitutability' has been widely used in recent analytical treatments of morpheme arrangements, in particular in the discovery or identification of immediate constituents (ICs). Unfortunately, the criterion has one fatal flaw rendering debatable almost every analysis employing it: some 'substitutions' are deemed 'better' guides to analysis than others because they are more 'common' or more 'frequent' or—at bottom, the same thing—more 'grammatical.'

It may be objected that the 'frequencies' figuring as criteria in IC analysis are not drawn from any published researches on actual text frequencies or dictionary frequencies of classes of items resulting from alternative analyses of sentences such as The King of England opened Parliament. It may be added that, in the absence of such replicable sources for data on frequencies, the criteria appear to be guesses about frequencies—guesses by the linguist acting as native speaker. Such criteria are in the long view unsatisfactory: not only does motivation occasionally influence perception in the most objective of men, but there is no way to decide between the guesses of native speakers who, equally trained and well-intentioned, yet disagree as to the 'frequencies' involved in a certain analysis. These difficulties might conceivably be removed by the tedious and resource-consuming procedure of counting actual frequencies; but there would still remain a more formidable objection to the concept of substitution.

This objection arises from the fact that both morphemes and words are primitive (i.e., undefined) notions in IC analysis. The attempt is made below to show that both of these notions, in representative contemporary linguistic theory, are themselves determined partly by the use of substitution as a criterion. If that is the case, guesses as to the 'productivity' of (relative numbers of items occurring in) the resulting classes are a factor in choosing one analysis over another, here as on the IC level. As a result, frequency-guesses play a role in defining the very units whose frequencies are to be criteria of their further classification. Thus the relative frequencies of products of analysis are both a necessary condition and an expected result of this variety of analytical treatment. The recursiveness of such interdependent definitions appears to amount to inadmissible circularity.

3. The most ingenious and rigorous attempt at a complete exposition of the bases of morphemics is by Harris who explicitly avoids the use of meaning as a device in

On identical distribution, cf. also C. E. Bazell, Linguistic Form, Istanbul 1953, and E. Fischer-Jorgenson, Acta Linguistica VII pp. 33-4.

morpheme segmentation.[6] Instead, his principal criteria are: (1) simultaneous weighing of distributional interrelations (frequency-guesses) as an aid to deciding between possible (2) substitutions. Both (1) and (2) are summed up in the somewhat nebulous criterion (3) 'ease of statement.'

Examples of the use of criterion (1) are cited in footnote, with italics for *identical relations* added by me.[6a]

From the Identity Theorem it appears that the expression 'identical relations' in the quoted passage renders the passage logically impossible as a description of procedure. In addition, the phrase 'only if it will turn out that' clearly indicates that very many hypotheses as to the results of segmentation must be tested simultaneously before any result can be accepted as satisfactory. This criterion appears exceptionally difficult to specify with an exactness sufficient to ensure replicability among investigators;[7] it may be impossible for any but a native speaker to apply this criterion to any corpus that is not narrowly restricted. Applying this criterion to an infinite corpus through an informant is almost certain to be impossible.

In any event, the expression 'many other' leaves unclear the (presumably guessed at) number of sequences to which the sequence must have 'identical' relations before the criterion is satisfied.

[6] Zellig S. Harris, Methods in Structural Linguistics. Chicago, 1951 (12.2, Appendix to 12.41, page 173 fn. 38).

[6a] "We therefore restrict the application of 12.22 by saying that we will consider particular tentatively independent phonemic sequences as morphemic segments only if it will turn out that many of these segments have *identical relations* to many other tentatively independent phonemic sequences." (12.23)

[7] It is often easy to show that another investigator's analysis of part of a language is inadequate; it is far more difficult at present to show that one's own analysis of the entire corpus is preferable to his. The latter comparison is the only kind that follows from the 'simultaneous weighing'—criterion.

Further examples are quoted at length from Harris, with Harris' footnotes 12 and 13 immediately following.[7a]

[7a] "This criterion of distributional patterning may be approached in a somewhat different way. Given the phoneme sequence /'boyliŋ/ *boiling*, we ask if it is to be analyzed as consisting of one morphemic segment or two; and if two, where is the dividing line. To test whether there are two morphemes present, we take *boiling* in some environments in which it occurs (say, *It's--now. I'm--it now.*), and see if *boiling* can be replaced there by some other phoneme sequence which is partially identical (e.g. /'stapiŋ/ *stopping*).[12] We can now say that *boil* and *stop* are tentatively independent phoneme sequences, since we find them in the environment *I'm--ing it now* as well as in other environments (e.g. *I'll--it.*). Since there are many other phoneme sequences (*take*, etc.) which occur in these two environments and in precisely the other environments of *boil*, *stop*, we consider the criterion of 12.23 satisfied and regard *boil*, *stop*, *take*, etc. as morphemic segments.[13]"

"[12] If *boiling* can be replaced in that environment by any other phoneme sequence (including zero), then *boiling* as a whole is tentatively independent in that environment. If the phoneme sequences which substitute for *boiling* are partially identical with it (e.g. *stopping*) we can say that the identical portions in the various replacements are part of the environment, and that it is only the non-identical portions which replace each other. (In general, the environmental frame is that which is invariant under the various substitutions; the substituting stretches are those which differ for each substitution.) We can now go further and say not only that *boiling* is independent of its environment, but also that *boil* is independent of its environment, too (as is *#-ing*).

"[13] Alternative divisions of *boiling* into morpheme segments would not equally satisfy the criterion of 12.23. If we seek substitutes for *boiling* which have some partial identity with it other than *-ing*, we will not find any whose non-identical parts enter, together with the part of *boiling* for which they substitute, into clear distributional classes. For example, we cannot substitute *princeling* or *boys* for *boiling*, since these do not occur in *I'm--it now*. The partial identity of these is of no use in analyzing *boiling* since these two are not distributionally equivalent to *boiling* in the first place. If we substitute *trailing*, we might try to say that /trey/ *trai-* replaces /boy/ *boi-*. We might further say that

4. These quotations, exemplifying use of the criterion of 'simultaneous weighing' (or distributional patterning), also make use of the criterion of substitution.[8] Substitution alone is also indicated as an analytical device by Harris.[8a]

5. Leaving aside criterion 1 ('simultaneous balancing'), which is designed to guide the selection of non-trivial substitutions, we may ask whether criterion 2 (substitution) is itself behavioristically defensible, i.e., whether it can be codified to the point of replicability among investigators.

The chief decision to be made in considering substitution as a canon is the choice of a population of utterances within which are to be sought utterances manifesting replacement. Most finite corpora ever investigated (e.g., the Agard-Carroll transitional probability corpus, the Thorndike-Barnhart word-count corpus) are far too small to contain the examples that have been used to illustrate the method. It is possible that a restricted corpus might contain not a single instance of *The King of England opened Parliament; I went crazy yesterday; Take the myths.* The paragraph quoted in fn. 8a, and the sample utterances in Harris's book suggest that the corpus is infinite and that the problem is to devise techniques for extracting utterances that are analytically relevant in that they differ from a particular utterance in a stated way. Elsewhere (2.33) Harris implies that the corpus is finite.[8b]

/trey/ and /boy/ also replace each other in other environments as apparently to satisfy the criterion of 12.23: *five trays, five boys.* However, other substitutes of /trey/ and /boy/ in *I'm--ling it now* will not substitute for them in *five--s*: /mey/ (from *mailing*) rarely (*five Mays*); /sey/ (from *sailing*), /se/ (from *selling*), /kə/ (from *culling*) never. Hence we cannot divide *boiling* (in environments of the type mentioned) into *boi* (*boy*) and *ling*, but only into *boil* and *ing*.

"We do not always find such extreme cases as the adequacy of *boil-ing* compared with the inadequacy of *boi-ling*. It is therefore often convenient to make the division into morphemic segments first in the case of those utterances and parts of utterances in which the difference in adequacy among various alternative segmentations is extreme. The less obvious choices of segmentation can then be decided with the help of the classes of morphemic segments which have already been set up. Even then, new data may lead us to rescind some of our previous segmentations in favor of alternative ones which pattern better with the new data. Cf. Charles F. Hockett, Problems of morphemic analysis, LANG. 23.321–343 (1947)."

[8] I have advanced a number of criticisms of substitution as a criterion in Lg. 31.49–50 (1955).

[8a] "Every utterance contains at least one morphemic segment (since the whole utterance can be substituted for another)." (12.21)

"A necessary but not sufficient condition for considering an element to be independent in a particular utterance is if that utterance can be matched by others which are phonemically identical with the first except that the element in question is replaced by another element or by zero." (12.2)

"No matter how we go about the dividing of an utterance into its morphemes, this much will in any case be involved: The morpheme boundaries in an utterance are determined not on the basis of considerations interior to the utterance, but on the basis of comparison with other utterances. The comparisons are controlled, i.e. we do not merely scan various random utterances, but seek utterances which differ from our original one only in stated portions. The final test is in utterances which are only minimally different from ours."

[8b] "Investigation in descriptive linguistics consists of recording utterances in a single dialect and analyzing the recorded material. The stock of recorded utterances constitutes the corpus of data, and the analysis which is made of it is a compact description of the distribution of elements within it. The corpus does not, of course, have to be closed before analysis begins. Recording and analysis can be interwoven, and one of the chief advantages of working with native speakers over working with written texts (as is unavoidable, for example, in the case of languages no longer spoken) is the opportunity to check forms, to get utterances repeated, to test the productivity of particular morphemic relations, and so on.

"To persons interested in linguistic results, the analysis of a particular corpus becomes of interest only if it is virtually identical with the analysis which would be obtained in like manner from any other sufficiently large corpus of material taken in the same dialect. If it is, we can predict the relations among elements in any other corpus

The last sentence quoted in fn. 8b is misleading from the standpoint of one 'interested in linguistic results'[9] since it implies that, where substitution is to be used, something other than all possible (infinitely many) utterances of the language would constitute a possible corpus. Where substitution is intended as a realistic criterion, the examples must be a sub-set of utterances drawn from a population consisting of all possible linguistic responses of at least a single speaker.[10] (It could, of course, be applied to finite corpora, but no purpose would be served, for not all the relevant 'substitutions' could occur.) Thus, the entire language' (a set of possible responses) serves as a pool from which are drawn, non-randomly, related utterances showing 'substitutions'. It is the contention here that the process of drawing the examples is crucial to the analysis and that it is a weak, possibly fatally weak, link in the chain of investigation. Its weakness results from the fact that, where the linguist is not a native speaker of the language, the process devolves in an unstructured way upon the informant.

6. Substitution is difficult to render replicable since, in informants, it apparently depends to some extent on individual personality variables, the parameters of which are extremely difficult to estimate crossculturally. Moreover, since substitution has to be carried on together with simultaneous weighing of (guessed) frequencies (criterion 1), it has to be—for all practical purposes—carried out by the linguist himself.[11] It follows that these criteria are—practically—applicable only to the linguist's own native language. Replicability across language boundaries is thus virtually absent.

7. The 'ease of statement' criterion is variously touched upon in Harris' Methods of Structural Linguistics; I quote three statements and add italics for emphasis.[11a] In these instances and in other places where the 'ease of statement' criterion appears, it is in part a restatement of the 'simultaneous weighing' criterion rather than a criterion *per se*. Harris and others, however, have used it as a sort of court of last resort.

8. Determining whether this criterion has been fulfilled in any given instance requires definition of the terms: 'conveniently,' 'general,' and 'simply,' and judgment of the alternative statements as to' convenience,' 'simplicity,' etc. Otherwise this criterion, like that of 'simultaneous weighing' (distributional patterning), does not satisfy the requirement of replicability; most of the

of the language on the basis of the relations found in our analyzed corpus. When this is the case, the analyzed corpus can be regarded as a descriptive sample of the language. How large or variegated a corpus must be in order to qualify as a sample of the language is a statistical problem; it depends on the language and on the relations which are being investigated. For example, in phonologic investigations a smaller corpus may be adequate than in morphologic investigations. When the linguist finds that all additional material yields nothing not contained in his analysis he may consider his corpus adequate."

[9] The method, of course, is of interest *per se*.

[10] Obviously all the actual utterances of a single speaker, even if he speaks continuously from birth to death, are finite; his possible utterances, on the other hand, are infinitely many.

[11] Harris, Z. S., From Phoneme to Morpheme, Language, 31.190 (1955): "We lack, however, any direct procedure for finding the segments which morphological analysis would show to be morphs. We have had to depend upon various indirect methods, or upon distributional or semantic guesses, to tell us what segments seemed worth testing for morphemic status."

[11a] (12.2) "It will be found necessary . . . to rewrite some of these smaller subdivisions into such divisions as *can most conveniently have their distributional interrelations stated.*"

(12.233) "However, if we say that *notice* consists of *note* plus some other morpheme, *we will not be able to make such general statements about the new morphem*; it will always occur after *note*."

(12.4 fn. 34) "In effect, the morphemes are those phonemically identifiable elements *in terms of which the inter-element relations can be most simply stated*." (Emphases nine in all three above quotations, D. L.O.)

reasons for stated decisions will remain available only (by introspection) to the linguist himself and not to his colleagues.

9. It was doubtless some of these difficulties that impelled Hockett to list 'challenges' remaining to be met.[12] Hockett himself deals ingeniously with the problem of calculating the efficiency of statements. Nevertheless, his over-all treatment will not stand quite as it is; he does not face the problems presented by his postulation of the inverse of the Identity Theorem.

10. The most ambitious attempt (Harris's) to state the bases of contemporary morphemics depends, in the definition of morphemes, to a significant extent on: substitution, 'ease of statement', and 'simultaneous weighing of distributional patterning', which last criterion depends in considerable measure on guessed frequencies of the classes thus defined.

Most of Harris' imperfections have turned out to be, in the view presented here, shortcomings in behavioristic interpretation (in the logical sense) that lead to loss of replicability; they are not shortcomings in the 'logic of distributional relations'. That logic, in fact, has been largely the result of Harris's pioneering and will remain, in my opinion, the abiding contribution of his Methods in Structural Linguistics.

11. Having established that SUBSTITUTION, guided by FREQUENCY-GUESSES, is a necessary condition to contemporary morphemics, we now investigate the application of these two criteria in IC analysis. If there is logical inconsistency, it is only because the SAME CRITERIA are applied to the SAME UNITS to produce .what purport to be DIFFERENT ANALYSES at 'different levels.' There is nothing objectionable in applying the same criteria (e.g. 'non-contrastive distribution') to DIFFERENT units (e.g., both phones and morphs) to delineate different classes (phonemes, morphemes) at different 'levels' (phonemics, morphemics).

12. It is here that we come to grips with the ubiquitous concept of 'distributional patterning,' which, operationally, appears to be identical to frequency-guessing. Certain classes of morphs (morphemes) are to be determined, at least in part, as a result of their 'patterning' relative to other, tentatively established, classes of morphs (not morphemes, but focus-classes, specifically MORPHEME-CLASSES). These morpheme-classes, as a necessary condition of IC analysis, are composed of morphemes defined necessarily but not sufficiently in terms of these and other morpheme-classes. The morpheme-classes are, when they enter into the definition of morphemes, of course referred to only as classes of MORPHS. By the same token, when they enter into IC analysis they are referred to as classes of MORPHEMES. The fact that leads to circularity is this: for the purpose of guessing frequencies ('determining distributional patterning') they are

[12] "Such considerations should at the very least convince us that there is, as yet, far less rigor and far more rule-of-thumb in linguistic analysis that we should like to believe. The general approach involved in the formalization of the present paper is not, of course, the only possible or actual approach in linguistic analysis; there is also the challenge of a clearly worked-out procedure that makes systematic and defensible use of semantic criteria; there is also the challenge of a clearly worked-out 'item and process' model instead of the 'item and arrangement' model implied here and by Harris, either non-semantic or semantic. But to think that any of these alternatives has, as yet, made any FURTHER advance away from rules-of-thumb and toward logical rigor than has the non-semantic item-and-arrangement model would be absurd. Unless we are simply to revert to a medievally obscurantist concentration on *ad hoc* solutions of individual languages or parts of languages, we face and must meet a challenge of clarification greater than any that has yet been confronted in the scientific study of language."

Hockett does not come to grips with the problem of segmentation, since his definitions of "stretch" and "sub-stretch" appear to be equivalent, op. cit.

one and the same class of items, whether called morphs or morphemes.[13]

13. Briefly: MORPHEMES are prerequisites to the definition of MORPHEME-CLASSES; knowledge of the members and frequencies of MORPHEME CLASSES are (under another name) prerequisite to the definition of MORPHEMES.

That two things A and B are subject to mutual implication is an acceptable, indeed ordinary, state of affairs in logic. Nevertheless, when A and B are operational definitions (as scientific definitions of a particular morpheme and a particular morpheme-class must ultimately be), the circularity is crippling.

14. Paragraphs **11, 12** and **13** constitute an over-view of what is to follow. In the next section we consider the evidence for these somewhat sweeping assertions.

15. Of the several treatments of Immediate Constituent analysis, the most thoroughgoing and successful is that by Wells.[14] It is based in part on Harris's Methods and is a logical extension of them into the realm of syntax. Furthermore, Wells's treatment has served as a basis for recent applications of IC analysis. It is therefore appropriate to investigate the concept of patterning as used by Wells to test the hypotheses developed above.

16. Two points in the passage quoted in fn. 14 deserve comment: 'that some morpheme classes are trivial, and in practice ignored', and that 'the grammarian focuses his attention . . . on . . . such clusters of roughly coincident classes'. In the absence of any other criterion for 'triviality', it appears that relative infrequency is indicated; any argument based on the 'structure' of the

[13] That is, the class of morphemes is a class of classes, each of which is a class of morphs. Thus for any language the class of morphemes is identical with the class of morphs, except that assignment of morphs to morphemes is implied by the former class and not by the latter. It is possible, though by no means certain, that the linguist (when guessing frequencies) can take account of the classification into morphemes. However, it is highly unlikely that the informant can do so, unless he has had training in morphemics. Put another way, the linguistic data that are included in the class of morphemes are identical with the linguistic data included in the class of morphs. The only difference is a matter of theory, not of data; whether that theoretical difference is controllable (in guessing frequency) in a replicable way is a matter, I suppose, for psychological experiment of a rather challenging sort.

[14] Rulon S. Wells, Immediate Constituents, Lg. 23.81–117 (1947). The contrasts between Wells' IC-analysis and that of Harris are interestingly reviewed by Chatman (Word 11.377–85, 1955).

Consider the following quotation from Wells (p. 81):

"Morphemes are assigned to MORPHEME-CLASSES on the basis of the environments in which they occur. Each environment determines one and only one morpheme-class, namely the class of all morphemes occurring in that environment. To the morpheme-class determined by the environment ( )*ly* (adverbial) belong *slow*, *near*, *quaint*, and many other morphemes; but not *dead*, because the *ly* of *deadly* is not the adverbial *ly*; not *pick*, because *pickly* does not occur, and not *unhesitating*, because *unhesitating* is not a morpheme. A morpheme A belongs to the morpheme-class determined by the environment *a* ( ) *are*, i.e. the morpheme-sequence *a man are* occurs; witness the utterance *The sons and daughters of a man are called his children*. This example shows how it can happen that a morpheme occurs in an environment only if that environment, together with the morpheme itself, occurs in a certain larger environment (the phenomenon called 'grammatical agreement'); it was selected to show also that some morpheme-classes are trivial, and in practice ignored by the grammarian. The fact is that certain morpheme-classes wholly or nearly coincide. The morpheme-class determined by the possessive singular morpheme, is very nearly the same as the one determined by the plural morpheme, both classes being called 'nouns' in common parlance. It is such clusters of roughly coincident classes on which the grammarian focuses his attention. Also, some classes are included in others; e.g. all single-morpheme proper nouns are single-morpheme nouns, but not conversely."

language would, at this stage, be begging the question. The second point apparently demands a judgment in terms of 'dictionary' frequencies of occurrence in their several environments (ranges) of classes of morphemes; moreover, we need criteria of 'coincidence': how many unshared environments are permitted two classes before they are declared non-coincident? This question will plague, I believe, any analysis in terms of classes; it is not surprising that Wells leaves it unsettled at this stage.

17. That the utility of the operation of substitution depends in large measure on both the frequency-guesses and the linguist's knowledge of the language ('patterning') is revealed by Wells (p. 82).[14a]

18. The examples cited in fn. 14a do not, in fact, show that "*Tom and Dick* is substitutable for *they*, wherever *they* occurs." Quite the contrary. Elsewhere[15] I have pointed to the difficulties involved in prescribing operations for determining what is a 'grammatical utterance'. Informants can report whether an utterance occurs or not, and they can report their tertiary responses, which, as is well known, may not always be based on the facts of usage. To say that non-occurrent utterances are 'grammatical' makes no sense if 'grammatical' is descriptive of regularities found among the utterances (occurrent) in some corpus of the language.[16] And in any event, if the notion 'grammatical' is a product of linguistic analysis (and not a product of informants' tertiary responses), it obviously cannot enter as a primitive concept in linguistic analysis.

In brief, if our test of whether an utterance is 'grammatical' is based on some sort of judgment of the informant, it may properly enter into linguistic analysis. To render such information replicable, however, requires much more cross-cultural pretesting of the requisite psychological techniques for eliciting such judgments. Voegelin and Harris[17] have made a start, and concentrated effort in this area might yield valuable results. So far, however, no such replicable tests have been developed. Therefore, the concept 'grammatical', being a result of analysis, cannot be a pre-condition of analysis.

19. IC analysis is dependent, in its further development, on the linguist's guess as to the dictionary-frequencies of the resulting hypothetical classes, as is shown by the following quotation:

"It helps the IC-analysis to show that the sequence being analyzed is an expansion, but only if it is an expansion of the same shorter sequence in all, or a large proportion, of the environments where the shorter sequence occurs."

('Expansion' has been defined earlier by Wells in terms of substitution-possibilities.)

Some of the difficulties noted earlier in connection with 'grammatical' utterances

[14a] "Now the simple but significant fact of grammar on which we base our whole theory of ICs is this: that a sequence belonging to one sequence-class A is often substitutable for a sequence belonging to an entirely different sequence-class B. By calling the class B 'entirely different' from the class A we mean to say that A is not included in B, and B is not included in A; they have no member sequences in common, or else only a relatively few—the latter situation being called 'class-cleavage.' For instance, *Tom and Dick* is substitutable for *they*, wherever *they* occurs; *They wanted me to come* is a grammatical sentence, and so is *Tom and Dick wanted me to come. They did it because they wanted to* is grammatical, and *Tom and Dick did it because Tom and Dick wanted to* is equally grammatical, being uncommon for stylistic reasons only. Similarly, *The stars look small because they are far away* and *The stars look small because Tom and Dick are far away* are both grammatical, the second sentence being uncommon (or not used) for semantic reasons only."

[15] Language 31. 49–50 (1955).

[16] For that a given sequence does not occur is as much a fact of grammar as that certain others do occur.

[17] Harris, Zellig S. and Voegelin, C. F., Eliciting in Linguistics, Southwestern Journal of Anthropology, Volume 9, Number 1, 1953.

appear to return at this point, since the examples given (*the King of England* as an expansion of *a queen*) do not seem to be actually substitutable for the sequences of which they are expansions in a very 'large proportion' of their environments. It may be that some members of the (tentatively assigned) sequence-class of the expansion are substitutable for the shorter sequence in some of its environments. But if the expansion itself does not occur in many of those environments, it can be said to 'be' an expansion 'in those environments' only by the same analogy in terms of which non-occurrent utterances are said to be 'grammatical.' Again the linguist appears to be using information properly available only after the analysis is complete. This information often smacks strongly of traditional 'semantically' defined grammatical categories, as witness this passage:

"The whole sentence, therefore, is an expansion of *John worked*, which is of a fundamental sentence-type because it is not expansion (except in a very few environments, such as the zero environment) of anything shorter; but *John worked* and *John works*, each containing three morphemes, may be regarded as expansions of each other. Thus the search for expansions leads us to the actor-action sentence type; we do not need to take it for granted."

20. The last sentence has perhaps been more misleading than any other in the exposition of IC analysis; for almost a decade doctoral candidates have included the 'actor-action sentence type' as an undefined term underlying their treatments of the syntax of various languages, in the belief that it had been defined here. On the contrary, no definition, either formal or operational, was vouchsafed. We are said to be 'led to it' by the 'search for expansions'. But we are not told when to stop; surely the method indicates that we are to proceed to sequences like *John*, *is*, and *me*, all of which are models for *John worked*, and, it appears, not expansions of anything in any environment. These—truly 'fundamental sentence types'—are (with the possible exception of *is*) simply morphs. The parenthetical 'such as the zero-environment' rates more mention than that: the zero-environment is the only one in which nearly any sequence is substitutable for nearly any other. There seems to be no reason to stop short of it at the 'actor-action sentence-type', which, in any case, is something limited to English if the above quotation is taken as defining it. 'Actor' and 'action' may be semantic categories. They might—though it has neither been done nor shown to be valuable—be defined for English as the classes of sequences that are respective expansions of *John* and *worked*. For all other languages, however, 'actor' and 'action' are so far operationally meaningless, unless defined elsewhere.

21. That IC analysis not only uses but is specifically limited by frequency-guesses appears in Wells (p. 90).[17a]

The criteria for deciding whether a focus-class is 'more important' or 'more major' than others are made clear by various passages in Wells.[17b]

[17a] "No IC-analysis will recognize all the focus-classes there are, nor all the associative groups; an analysis results from determining some focus-classes and some associative groups to be more important (more major) than others."

[17b] "It is easy to define a focus-class embracing a large variety of sequence-classes but characterized by only a few environments; it is also easy to define one characterized by a great many environments in which all its members occur, but on the other hand poor in the number of diverse sequence-classes that it embraces. What is difficult, but far more important than either of the easy tasks, is to define focus-classes rich both in the number of environments characterizing them and at the same time in the diversity of sequence-classes that they embrace. Actor and action (or in older terminology subject and predicate) are such focus-classes." (p. 87).

"Judged by this criterion of over-all consequences, the analysis *the king of England | opened Parliament* is better than *the king | of England*

22. The criteria for 'importance' thus involve judgments on three questions: *sameness of meaning*, *number of environments*, and *number of members* of a focus-class ('variety of content'). The last two are different kinds of frequency-guesses. We therefore turn to the question of 'sameness of meaning'.

23. Contrary to some recent opinion, we follow Bloomfield in believing that a behavioristic determination of the question of 'sameness of meaning' (or, rather, 'difference of meaning') is possible, using responses of the informant—providing that the morphemic analysis does not permit homonymous morphemes.

The question of homonymous morphemes and constructions is posed by Wells.[17c]

24. The second paragraph quoted in fn. 17c appear to be contradictory in the light of the Identity Theorem, since if any two items have identical ranges they cannot be 'semantically different' even if phonemically different. The crucial phase is 'phonemically identical but different in meaning'.[18] The operational question is: given different occurrences of the same sequence of phonemes, can we learn from an informant's responses whether they 'differ in meaning'? Consider the utterance *he got the post*, which can be paraphrased in several ways: he received the fence post, he obtained the mail, he was assigned the inside position in a horse race, he hit the fence post (instead of the target), he secured the job. The first two meanings of 'post', although perhaps historically related, might be said to be 'different' by an informant; the first and third, on the other

opened Parliament, because there is a focus-class to which *opened Parliament* belongs, embracing more sequence-classes and occurring in more environments than any focus-class to which *of England opened Parliament* belongs. It is true that there are some environments, such as *the King of Scotland* and ( ), where the latter sequence but not the former occurs; it is also true that a focus-class to which *Of England opened Parliament* belongs included some sequence-classes not included in the focus-class of *opened Parliament*—for instance, the class to which *by marriage runs a bank* belongs in *my cousin by marriage runs a bank*. In fact, the example makes it clear that wrong analyses into ICs tend to support each other, just as right ones do. But right analyses are ultimately supported from without by the method of regarding them as expansions of shorter sequences, whereas wrong analyses lack this ultimate extraneous support. And right analyses turn out to relegate more sequences to larger focus-classes (larger both in diversity of membership and in the number of characterizing environments) than those to which wrong analyses would relegate them. *Opened Parliament* occurs, thus differing from *of England opened Parliament*, after adverbs and also in zero environment (i.e. as a sentence by itself).

"This is the fundamental aim of IC-analysis: to analyze each utterance and each constitute into maximally independent sequences—sequences which, consistently preserving the same meaning, fit in the greatest number of environments and belong to focus-classes with the greatest possible variety of content." (p. 88).

[17c] "Now—and this is the relevance of construc-

tions in the theory of ICs—the IC-analysis should reflect the construction. Consequently, when the same sequence has, in different occurrences, different meanings and therefore (provided that the meaning-difference cannot be ascribed to the morphemes taken separately) different construction, it may have different IC-analysis. The IC-analysis of a sequence often reflects the semantic analysis of what the sequence means, but the meaning needs to be considered in making the analysis only when two occurrences of the same sequence (or of two sequences belonging to all the same sequence-types) have meanings incompatible with each other.

"Such cases exhibit HOMONYMOUS CONSTRUCTIONS, analogous to homonymous morphemes. Perhaps the most current meaning of the 'homonym' is that two morphemes (or two sequences in general) are homonyms if they are phonemically identical but different in meaning. A narrower definition is that two morphemes are homonymous if they differ in meaning alone. It follows that two morphemes cannot be homonymous in this narrower sense unless they belong to all the same morpheme-classes, for otherwise they would be gramatically as well as semantically different."

[18] The difference in meaning must be established by responses of the informant, not by (hypothetical) definitions in terms of environments, which would be begging the very 'structural' question that the establishment of homonyms is intended to help answer.

hand, since the historical connection is a bit more recent, might be said by one informant to be 'the same' and by another to be 'different.' Cross-culturally, such distinctions are likely to depend largely on the terms for 'same' and 'different' in the contact language and on the cultural tradition of tertiary responses regarding 'homonyms'. It therefore seems preferable to establish classes of items that may seem, at the end of the analysis, to have unusual ranges rather than to try to break them down further by methods of dubious replicability.

25. While we are considering the bases of Well's IC analysis it is perhaps well to delineate a more fundamental reservation about his formulation than any expressed above. This reservation concerns Wells's view of the function of methodological investigations in linguistics.[18a]

We do not object to the second paragraph of the quotation in fn. 18a as a statement of what Wells's highly suggestive article actually contained. Nor do we dispute that a few examples are insufficient to demonstrate the superiority of one analysis over another. What does seem open to objection is the theme of the first paragraph. For errors to compound each other and be incorrectable by any 'mechanical procedure' is a fatal attribute for any scientific system. The unspecified methods of correction hinted at in the last two sentences of the paragraph do not suffice as a description of the necessary correctives. Intuition is a priceless attribute for the inventor of scientific procedures, but it cannot be codified into procedures without causing them to lose a quality indispensable in science: replicability.

26. Wells states his position more clearly at another place; my italics are added to the quotation.[18b]

All our objections to Wells's methods up to this point are summarized in the difficulties inherent in the emphasized sentence cited in fn. 18[b]. That the linguist prosecutes both inquiries at once is often true, but that fact does concern anyone discussing methods of discovery. For linguistic procedures, as scientific procedures in opposition to the formal ones of logic, are methods of discovery; procedures of exposition are second-

[18a] "Hence errors, as well as right analyses, compound each other. For this reason, we do not propose our account as a mechanical procedure by which the linguist, starting with no other data than the corpus of all the utterances of the language and a knowledge of the morphemes contained in each one, may discover the correct IC-system. For any language, the number of possible IC-systems is very large; but in practice it is easy to see that most of the possibilities are negligible. Just as when working out the phonemics, the practicing linguist will discover many shortcuts.

"Because of the systematic interlocking of one IC-analysis with others, both of the same sentence and of other sentences of the language, it is not possible to demonstrate conclusively upon one or a few selected examples that, all things considered, such-and-such analyses are the best. All we can do is to delineate the proof and to show how far-reaching the consequences of any one particular IC-analysis may be."

[18b] "The task of IC-analysis is the task not of describing what utterances occur, but of describing, after these utterances have been given, what their constituents are. *In practice, the grammarian studying a language will prosecute both inquiries at once, and will have made up his mind about both before he expounds either; but this fact of procedure does not concern us.* Nor do we mean, when we say that all the grammatically possible utterances of the language are presupposed as data for the IC-analysis, that only a complete characterization of them is presupposed—a characterization which may well be in terms of the constituents of those utterances. This is circularity of exposition, but it is not vicious, nor is it avoidable except by basing the grammatical description, including the IC-analysis, on a finite sample of text. The distinction between methods of discovery and methods of proof (or more generally, methods of exposition), and between the order in which certain facts are discovered and the order in which they are expounded, is familiar to logicians. In descriptive linguistics, discovery consists in finding the best scheme in terms of which to describe the facts; it is not strictly part of the exposition to show that scheme is the best."

ary and, so long as there is little loss of information about what has been discovered, relatively unimportant. As Harris and Hockett pointed out, an item-and-process model may do as good a job of exposition as an item-and-arrangement one. The works of Sapir and Newman may be cited as evidence.

It is our contention here that, in a situation where linguists work simultaneously at different 'levels', it is the task of the methodologist to devise procedures that will permit discovery at any 'level' to proceed independently of findings at any level that is methodologically dependent on it. In other words, if B depends on A, then the results at B cannot be necessary conditions of discovery at A, or the circularity is vicious. This need not be redemonstrated in every application of the method to languages, but it should be demonstrably part of the procedure.

As Wells points out, circularity of EXPOSITION is not in itself reprehensible. However, it all too often masks circularity of DISCOVERY. At a time when grammatical discovery lacks even the methodological consensus accorded phonemics, it seems incumbent on the analyst to make his methods of discovery explicit enough that confidence may be placed in his findings, whatever their exposition.

SENECA MORPHOLOGY VIII: CHARTS, INDEXES, CORRECTIONS* AND ADDITIONS

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29. Charts
30. Indexes
30.1. General index
30.2. Allomorph index
31. Corrections and additions

29.1. Charts 1 and 2 provide a graphic summary of the verb and noun structures described in **5–25.** The irregularities of **26** are not included. The boldface numbers at the left of each row indicate the section in which the construction of that row is discussed. Some variations in order are not shown; specifically, those described in **10, 11,** and **21–25.** The ditto mark indicates that anything listed above it in the same column may occur, while broken lines show optional occurrence. In the charts and also in **30** and **31** it will be helpful to note that sections **1–4** are in Seneca Morphology I, **5–8** in II, **9–11** in III, **12–15** in IV, **16–20** in V, **21–25** in VI, and **26–28** in VII.

30.1. There follows a general index to structural features mentioned in the work. References are to paragraph numbers. The paragraphs listed for individual morphemes discuss either their occurrence or their shape.

ambulative morpheme 13.1, 13.13
animal names 26.7
aspect suffix 5.2, 5.5–11
attributive suffix 20.1–7
augmentative morpheme 20.2
automatic alternations 3.1–24
automatic variant 3.2
base 12.1
basic allomorph 3.2
basic prosodic shape 4.1
basically strong vowel 4.3
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causative I morpheme 13.1, 13.7, 26.3
causative II morpheme 13.1, 13.5
causative III morpheme 13.1, 13.3
causative-instrumental morpheme 13.1, 13.7
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cislocative morpheme 21.2–3, 21.6, 21.9–11, 22.1
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compound verb root 26.2
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contrastive morpheme 25.1, 25.4–5
dative morpheme 13.1, 13.12
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descriptive morpheme 5.5–7, 6.2, 13.2–8, 13.10–14, 17.1, 17.3, 18.1, 18.3, 19.1, 19.3
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diminutive morpheme 20.3
directive morpheme 13.1–2
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duplicative morpheme 21.1, 22.1–5, 23.1, 24.1–2, 25.1, 25.5
elliptical form 15.6, 26.6
enclitic 26.8
even vowel 4.2
eventuative morpheme 16.1–3
exclusive person morpheme 9.3, 9.11, 11.6, 11.10
expanded aspect suffix 16–19
expanded base 12–15
expanded noun base 12.1–3, 14.2, 15.6

* Seneca Morphology I, II, III, IV, V, VI, VII, IJAL 26. 11–22, 123–29, 224–33, 283–89; 27. 42–45, 114–18, 223–25.

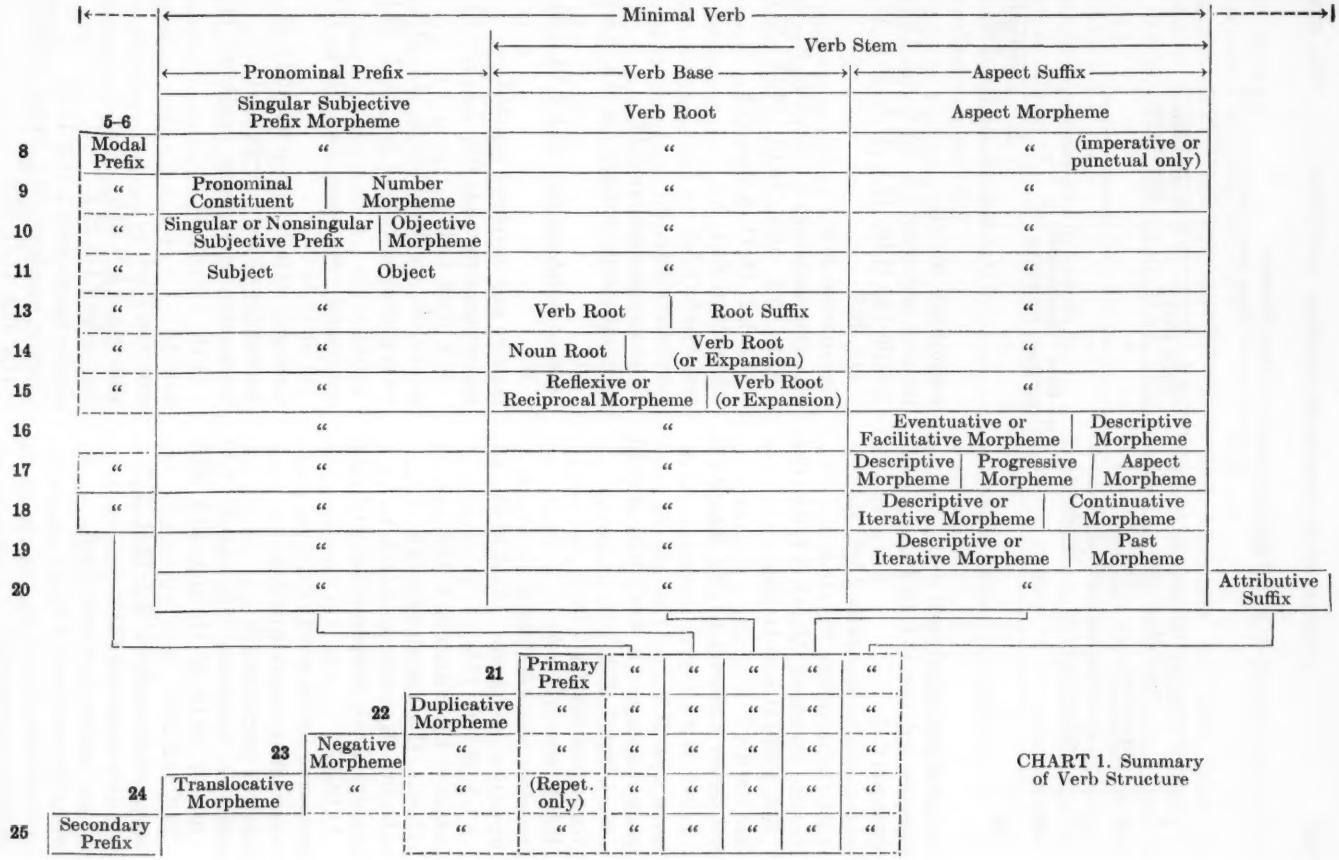

CHART 1. Summary of Verb Structure

CHART 2. Summary of Noun Structure

	← Noun Stem →			
	← Noun Base →		← Noun Suffix →	
7	Singular Subjective Prefix Morpheme	Noun Root	Noun Suffix Morpheme	
9	Pronominal Constituent | Number Morpheme	"	"	
10	Singular or Nonsingular Subjective Prefix | Objective Morpheme	"	"	
12	"	Verb Root (or Expansion) | Nominalizer Morpheme	"	
20	"	"	"	Attributive Suffix

expanded pronominal prefix 9–11
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expansion 2.15
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facilitative morpheme 16.1, 16.4
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final vowel 4.2
first person morpheme 6.1, 6.4, 9.3, 10.5–6, 11.2–6, 11.9
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indefinite morpheme 7.3
indicative morpheme 8.3, 8.6–7, 9.10, 10.9–10, 10.14, 11.14, 21.9, 22.3, 22.5, 23.2, 24.2, 25.5
instrumental morpheme 13.1, 13.11, 26.3
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internal locative morpheme 7.5–6
irreducible constituent 2.15
irreducible noun 7.1–6
irreducible utterance 2.4
irreducible verb 5.1–11, 6.1–11
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kinship terms 26.9
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minimal verb 21.1
modal prefix 8.1–7
morpheme class 2.15
morphological constitute 2.10
morphophonemic symbols 5.4, 6.3, 6.9–10, 10.8
negative morpheme 21.1, 23.1–3, 24.1, 26.5, 27.5
negative past morpheme 5.5, 23.3
neuter morpheme 6.1, 6.8, 7.2, 9.6, 10.5, 10.8, 10.10, 11.12
nominalizer morpheme 12.2–3, 14.2, 15.6
nonmasculine morpheme 9.6, 10.13, 10.15, 11.13
nonsingular morpheme 9.2, 10.13, 11.8, 11.10, 11.13
nonsingular objective prefix 9.1, 10.11–16
nonsingular subjective prefix 9.1–12
nonsingular third person morpheme 11.5, 11.11
noun 5.1
noun root 7.1–4
noun stem 7.1–6, 26.6
noun suffix 7.1–6, 26.4
number morpheme 9.2, 11.3, 11.13
objective morpheme 10.1, 10.6–8, 10.10–13, 11.5, 11.8, 11.11, 23.2
objective prefix 10.1–16, 15.3

odd vowel 4.2
oppositive I morpheme 13.1, 13.6
oppositive II morpheme 13.1, 13.4
optative morpheme 8.3–4, 8.6–7, 9.10, 10.9–10, 10.14, 11.14, 21.10, 22.4–5, 24.2, 25.5
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partitive morpheme 25.1–2, 25.5, 26.5
past morpheme 19.1, 19.3
phonemes 1.1–22
plural morpheme 9.2, 9.8–9, 11.3
pluralizer morpheme 20.7
populative morpheme 20.5
prefinal vowel 4.2
primary prefix 21.1–11, 22.1, 23.1, 24.1–2, 25.1, 25.5
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prosodic phonemes 1.18–19
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punctual morpheme 5.5, 8.1–5
purposive morpheme 5.5, 13.15
reciprocal morpheme 15.1, 15.3–5
reflexive morpheme 15.1–2, 15.4, 15.6
repetitive morpheme 21.2, 21.4, 21.7, 21.9–11, 22.1
restricted third person morpheme 11.7–11, 11.13
root suffix 13.1–15, 14.2
second person morpheme 6.1, 6.5, 8.7, 9.5, 10.5, 10.7, 10.10, 11.2–6, 11.8–10
secondary prefix 21.1, 25.1–5
simple noun suffix morpheme 7.5–6, 26.4
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verb 5.1
verb root 5.2–4, 6.3, 6.9–10
verb stem 5.2–11
vowels 1.2–8
vowel length 1.19, 3.19–22, 4.5–9, 26.8, 27.10
word 2.10

30.2. Allomorphs are listed below in alphabetical order, with æ after a, ɛ after e, ɔ after o, and ʔ, :, and O at the end. Symbols in parentheses are ignored in alphabetizing unless they are Seneca vowels or consonants. References are to paragraphs in which the allomorph is listed or its conditioning described.

-a- *exclusive person* 11.6, 11.10
-a- *indicative* 21.9, 25.5
-a- *objective* 10.1, 10.7–8, 11.5, 23.2
-'a- *masculine* 8.7, 9.11, 22.2, 23.2, 24.2, 25.5
-á- *iterative* 19.3
-'á- *iterative* 19.3
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31.1. The following changes should be made in the preceding installments of this work in the paragraphs indicated

0.2. Line 21. Add "and Betsy Carpenter" after "Corbett Sundown".

1.3. Line 1. Substitute "e" for "*e*".

1.8. Line 2. Substitute "[ǫ]" for "[ɔ]".

3.7. Lines 3–4. Substitute "(b) before sn, or (c) between open juncture and y." for "or (b) before sn.".

3.7. Line 9. Add "An example of (c) is the occurrence of h-*masculine* in an automatic zero allomorph at the beginning of yaktɔs *they (masc. du.) return* (colloquial).

3.11. Line 4. Substitute "a consonant" for "an obstruent".

3.12. Line 2. Substitute "w" for "*w*".

3.14. Line 4. Add "ʔw," after "sw,".

3.14. Line 13. Add "-a:ti- *be on the other side of* has the automatic variant -ɔ:ti- in nɔʔwɔ:tih *on which side it is;*" after "it will make shade again;"

3.15. Line 2. Substitute "o, ʔo, ʔa, :yo, or :ya. Examples are" for "o or ʔo:".

3.15. Line 4. Add "naʔáhtɛʔeh *which things,* ná:yoʔha:ste:k *how strong it might be,* na:yakɛʔ *she might say.*" after "*it was the only way,*".

3.24. Lines 21–22. Substitute "a consonant" for "an obstruent".
5.6. Line 2. Substitute "-óh" for "ó h".
9.5. Line 2 should begin "line".
9.8. Line 4. Substitute "-O-" for "-o-".
9.8. Line 28. Substitute "-O-" for "-o-".
10.1. Line 4. Delete "/" after "-yɔ-".
11.4. Line 1. Substitute "O-" for "-O-".
11.4. Line 5. Substitute "**9, 10**" for "**8, 9**".
11.13. Line 19. Substitute "-n-.[11]" for "-n-." and add the following footnote at the bottom of the page: "[11] Some idiolects have -ɔwɔ- before -n- also."
13.4. Line 1. Substitute "II" for "III".
13.5. Line 3. Delete "/-'O-".
13.10. Line 3. Add "/-shɔ-," after "-'ʔsɔ-".
13.10. Line 29. Add "-shɔ- in ʔo:nékitkɛ: shɔʔ *springs*, lit. *emerging waters* (-itkɛ- *emerge*)." after "(-'ʔse-),".
13.15. Follow with paragraph **13.16**:

13.16. There is another morpheme, the INTENSIFIER -hjiwɛ-, which occurs very rarely but seems also to be classifiable as a root suffix. It has been recorded only with the iterative -'h:sathótehji:wɛh *you are listening carefully*, teaka:nɛ́hji:wɛh *he is observing closely*.

15.6. Line 5. Substitute "a neuter" for "an impersonal".
19.3. Line 5. Substitute "-'O-" for "-'O".
24.1. Line 15. Substitute "heshatinɔ:ke?" for "heshatinɔ:he?".
25.2. Line 13. Substitute "nikáːwistaːkeːh" for "nikaːwistaːkeːh".
25.3. Line 5. Substitute "tsikeksaʔáːh" for "tsikeksaʔaːh".

KAIWA (GUARANI) PHONOLOGY[1]

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0. Introduction
1. Segmental phonemes
1.1. Inventory
1.2. Attestation
1.3. Phonetic description
1.4. Inter-phonemic specifications
1.5. Phoneme frequency
2. Prosodic phonemes
2.1. Nasalization
2.2. Juncture
3. Paralinguistic features
3.1. Stress
3.2. Stress-rhythm complex
3.2.1. Rhythm formation devices
3.2.2. Stress-rhythm patterns

0. Recent trends in the methods of linguistic analysis have tended to shift the focus from lower to higher levels of structure. In the past decade an increasing number of phonemic descriptions have included juncture and, less frequently, intonational phenomena. There is still general disagreement, however, as to the validity of extending the techniques of current phonemics to larger phonological stretches than word variability.

The first approach to the study of the higher level phonemes of Kaiwá[2] was based on the assumption that there would be intonation contours such as those described for English and other Indo-European languages, in which the pitch or perhaps a correlation of pitch and stress indicate finality, incompleteness, interrogation, etc. This hypothesis soon proved unproductive. No contrastive pitch patterns which correlated with the categories postulated were found. However, it was noted that certain features seemed to occur in a narrative only where the speaker seemed to be angry, excited, intensely moved, or interested in

[1] This paper was presented as part of the requirements for the Master of Arts degree at Indiana University, 1961. I am indebted to C. F. Voegelin, F. M. Voegelin, and F. W. Householder, Jr and to Sarah Gudschinsky of the Summer Institute of Linguistics for their invaluable suggestions.

[2] Kaiwá was classified as a Tupi language by McQuown in 1955, reclassified as a dialect of Guarani by Darcy Ribeiro in 1957. It has also been referred to as teüi, tembekuá, kaiúa, kaigua, kaingua, kaiowá, kayowa, cayua, kaiova, kaiuá, montese, apapocuva, caingua, mbya, avahuguai, paiguassu, yvytyigua, avachiripa, and catanduva.

The Kaiwá dialect of Guarani is spoken by around a thousand Indians living in cultural islands and three government posts in the southern part of the state of Mato Grosso, Brazil. On the posts the Indians are in contact with speakers of Terena (Arawak) and a second dialect of Guarani, and occasionally Portuguese. In the cultural islands, there is an occasional Indian who speaks some commercial Portuguese and/or the Guarani dialect of Paraguay. In a brief, unpublished, comparative study done by Sarah Gudschinsky, the Kaiwá dialect of Panambi proved to be slightly less divergent from the Guarani of Paraguay than Spanish is from Portuguese. The two Kaiwá dialects spoken by speakers under the directorship of the Francisco Horta Post are of about equal divergence from each other and from Paraguayan Guarani.

Data for the paper was collected in two field trips, December, 1958–April, 1959; October, 1959–April, 1960, under the auspices of the Summer Institute of Linguistics in cooperation with the anthropology department of the Museu Nacional, Rio de Janeiro, Brazil. Permission for extended contact with the Indians under the direction of the Francisco Horta Post was granted by the Serviço de Proteção aos Indios. The writer has also visited Kaiwá Indians on the SPI posts of Teikué in the municipality of Dourados and Jose Bonifácio in the municipality of Ponta Porã, and has studied the Kaiwá dialect spoken at the Francisco Horta Post during the months May, 1957–October, 1957, October–November, 1958. This paper treats only the material from Panambi, Mato Grosso.

confirming facts. Other features appeared to contrast when the speaker was expressing fear or discussing religious subjects.

The second approach was based on these features. The hypothesis followed was that there were contrasting phonological sentence patterns. Contrastive patterns were postulated for fear, anger, pride, excitement, reprimand, teaching, religion, etc. as opposed to a basic sentence pattern. Contrasting features including stress placement, length, syllable timing, pitch range, pitch register, speed, type of syllable pulse, and volume were used to distinguish the patterns.

Although this approach appeared to be more fruitful than the first, patterns postulated on the basis of the narrative of one speaker were of such a complex nature as to prove untenable in the analysis of further texts. Present analysis would assign many of these features to paralinguistics.

The present paper describes Kaiwá phonology in terms of a hierarchical structure with three co-occurent emic systems.

1. The first emic system of the Kaiwá phonological structure is that of the segmental phonemes.

1.1. The twenty segmental phonemes of Kaiwá are fourteen consonants: p, t, k, ʔ, b, d, j, g, q, v, s, š, h, r; and six vowels: i, e, ɨ, a, u, o.

1.2.1. Consonant phonemes are in contrast in analogous environments as indicated in the following sets of examples:

p / b / v: opa *it is finished*, aba *place*, áva *man*.

t / d / s / r: jetɨ *potato*, hedɨ *his saliva*, hesɨ *roast*, héri *his name*.

t / j / š: ita *rock*, ija *it fits*, išɨ *his mother*.

k / g / q: kóɨ *cultivated field*, gotɨ *side*, qóɨ *his own house*, kaʔu *intoxicate*, gaʔu *desire*, qahu *sing, dance*.

ʔ / h / r / no phoneme: kɨʔa *dirty*, kiha *hammock*, kira *fat*, bia *other people*.

p / t / j / k / q / ʔ: tapu *I must jump*, tatu *armadillo*, taju *I must arrive*, haku *hot*, hugɨ *his blood*, taʔu *I must eat*.

b / d / g: boʔi *necklace*, doʔu-i *he doesn't eat*, gotɨ *side*.

v / s / š / h: áva *man*, hasa *pass*, hašã *oldest daughter*, aha *I go*, vaʔe *indefinite pronoun*, saʔɨ *small cord*, šaʔɨ *green beans*, haʔe *I say, third person subject*.

1.2.2. Vowel phonemes are in contrast in identical environments:

i / e / a / u: haʔi *mother*, haʔe *I say, third person subject*, haʔa *I fall*, haʔu *I eat*;

a / u / o: hoʔa *he falls*, hoʔu *he eats*, hoʔo *his meat, flesh*;

i / ɨ / u: huʔi *ground meal*, huʔɨ *arrow*, huʔu *his cough*;

e / ɨ / a: oke *he sleeps*, okɨ *it rains*, oka *cleared land, patio*.

o / ɨ: ipo *his hand*, ipɨ *his foot*.

i / e / ɨ / a / o: ike *his sleep*, eke *you sleep!*, ikɨ *beside*, akɨ *I sleep*, oke *he sleeps*.

1.3.1. Consonants consist of two series of stops, a series of fricatives, and a flap.

1.3.1.1. Simple stops are voiceless, unaspirated and occur at bilabial, alveolar, velar and glottal points of articulation: /p/ pikɨ *fish*, ipepo *its wing*, ojapo *he does, makes*; /t/ tata *fire*, toisuʔu *he must bite*, jetɨ *potato*; /k/ karai *white man*, kɨ *which?*, doke-iri *he isn't sleeping*, jukɨ *salt*; /ʔ/ kɨʔa *dirty*, hoʔu *he eats, drinks (it)*, bedeʔɨ *unmarried girl, virgin*.

1.3.1.2. Complex[3] stops occur at the same points of articulation as simple stops. There is an additional complex stop at alveopalatal point of articulation.

Bilabial, alveolar and velar complex stops are pre-nasalized. The first two have nasal

[3] The unit consonant solution was arrived at on the basis of distribution. There are no non-suspect consonant clusters in the language. Vowel clusters do occur, but for the case of the velar stop, it would give an unique distribution—only occurring preceding a weak vocoid /u/. This latter solution was used for the analysis of the dialect spoken at the Francisco Horta Post where /g/ also occurs preceding other vowels. In the Panambi dialect however, the present solution seems preferable.

continuant allophones[4] at the same points of articulation. Continuant allophones occur with the prosodic phoneme of nasalization and preceding the occurrence of a pre-nasalized allophone within the same word: /b/ [^{m}b] baraka *rattle*, bia *other people*, šube *belt*; [m] badi?o *yuca*, abã *rain*, biba *domesticated animal*; /d/ [^{n}d] daipota-i *I don't want it*, jadu *spider*; [n] dadi *empty*, adõ *type of bird*, adĩ *negative command*, oinupa *he hit (it)*; /g/ agaite-bã *this instant*, oje?egi *she scolds*, obogúi *he causes disintegration*, obogi?a *he causes dirtyness*, oboge *he causes sleep*, goti *side*.

Alveo-palatal stop and alveo-palatal affricate are in free variation between speakers. The complex glottal stop is a labialized velar.[5] Nasal continuant allophones occur with the prosodic phoneme of nasalization and preceding the pre-nasalized stops: /j/ [d^{y}/d^{z}] jiva *arm*, dojohu-i *he doesn't find (it)*, jatiki *we drop (a liquid)*; [ñ] jadi *grease*, ajõ *alone*, jũ *grass, field*; /q/ [g^{w}] qirapa *bow*, qu *his own father*, qói *his own house*, beqe *slowly*.

1.3.1.3. The continuants occur at labial, alveolar, alveo-palatal and glottal points of articulation. The labial continuant[6] has two allophones: /v/ [v] voiced labio-dental fricative occurs preceding front vowels, except in co-occurrence with the prosodic phoneme of nasalization: borevi *tapir*, ĵjave *also*, api-qive *from here also*, vérabi *uncertain future*; [w] non-syllabic vocoid occurs preceding central and back vowels, with the prosodic phoneme of nasalization: voi *early*, avati *corn*, eju-vi *you come here for a short time*, hajivẽ *his beard, he also has a beard*, butúvi *large yellow fly*; /s/ so?o *meat, flesh*, sevo?i *worm*, sa?ĩ *small cord*, ohasa *he passes*; /š/ hašã *oldest daughter*, še *first person*, pošíto *man's ceremonial vest*, ša?ĩ *green beans*, oheša *he sees*, pišo *type of bird*, ipoši *he is angry*; /h/ hejõi *it is sprouting*, kiha *hammock*, hiapu *thunder*.

1.3.1.4. The voiced flap is at alveolar point of articulation: /r/ rabõ *if, when*, kira *fat*, ro?i *cold*.

1.3.1.5. The six oral vowels are: /i/ [i] high, close, front unrounded nonsyllabic vocoid occurs following a strong vowel; oipikúi *she stirs meal*; [i] high close, front, unrounded syllabic vocoid occurs elsewhere; ha?i *mother*, ijibo *it is thread*, isipo *it is vine*; /e/ [e] mid, close, front, unrounded vocoid occurs preceding /i/, /j/: daha?e-i *it isn't so*, ejotĩ *you plant*, jade jára *God of the white man*; [ɛ] voiced mid, open, front, unrounded vocoid occurs elsewhere: ha?e *I say, third person pronoun*, eqapi *you sit*; /i/ high central unrounded vocoid: ɨ *water*, pita *heel*, hu?i *arrow*, /a/ low, open, central unrounded vocoid: a-pi *here*, ikua *it's a hole, its hole*, tata *fire*; /u/ [ụ] high, close, back, rounded nonsyllabic vocoid occurs contiguous to a strong vowel parakáu *parrot*; aikuaa *I know*; [u] high, close, back, rounded syllabic

[4] The present economy of phonemes was first suggested by Sarah Gudschinsky, later by Fred. W. Householder, Jr..

[5] In other Guarani dialects described in the printed sources [g] and [g^{w}] are allophones of /g/. Only [g^{w}] occurs in Kaiwá.

[6] In a previous analysis the two phonemes /v/ and /u/ were postulated as being united into one phoneme /u/. The economy of phonemes, suggested by Florence M. Voegelin, may be stated: /u/ [v] voiced, labio-dental, central, flat, fricative occurs between silence and vowel or intervocalic preceding a front oral vowel, except where preceding contiguous vowel is nasal: ^{m}boreuí *tapir*; ídaue *also*; apigieu *from here also*; uérami *uncertain future*; [w] voiced, high, close, back, rounded, non-syllabic vocoid occurs between silence and vowel or intervocalic preceding central and back vowels; contiguous to nasal vowels; between consonant and vowel; between vowel and silence: uoí *early*; auatí *corn*; edúui *you come here for a short time*; hañiuę *his beard, he also has a beard*; parakáu *parrot*; ^{m}butúui *large yellow fly*: [u] high, close, back, rounded, syllabic vocoid occurs when preceded and followed by consonant or silence; in co-occurrence with stress: upéa *that person*; oduká *he kills*; hiú *father (address)*; ipukú *it is long*.

The resultant four syllable patterns, V, VV, CV, and CVV were in unlimited distribution, though internal phonemic specifications were, by definition, limited in VV and CVV syllables. The distribution of stress in the stress-rhythm units is stated more economically on the basis of the present analysis.

vocoid occurs elsewhere; upéa *that person*; ojuka *he kills*; hiu *father (address)*; ipuku *it is long*; /o/ low, close, back, rounded vocoid; ojoka *it splits*; so?o *meat, flesh*.

1.4. Kaiwá syllables are of two types: V and CV.[7]

Consonants occur syllable initial. /?/ and /g/ do not occur utterance initial. /j/ does not occur preceding /i/. There are no consonant clusters.

Vowels occur syllable and utterance initial, medial and final contiguous to any consonant except as stated above. Of the thirty-six theoretically possible clusters of two vowels, only six do not occur in the data. They are /ii/, /io/, /io/, /ui/, /uo/, and /uu/. Clusters of more than two vowels include at least one stressed vowel: daikuaa-i *I don't know*, parakáu *parrot*, bói *snake*, oboi *he cut (it) in pieces*.

1.5. All of the phonemes occur in the sample texts.[8] Vowels occur with a slightly higher frequency than consonants. Sample text four contains 411 vowels and 375 consonants. The high-low distinction in vowels shows the most contrast. Twice as many low vowels occur as high vowels. Central vowels occur statistically more frequently than either front or back, showing a ratio of two front to three central, one back to two central, and three back to four front.

Stops occur more frequently than continuants, the ratio being two and a half to one. Alveolar consonants are statistically most frequent. Velar consonants are statistically least frequent.

2. The second emic system of the Kaiwá phonological structure is that of the prosodic phonemes. Emic units in this system co-occur with larger phonological units than the segmental phoneme.

2.1. The phoneme of nasalization[9] occurs with the grammatical word. It is here marked by a tilde over the final vowel of the word: ipotĩ *it is pure, clean*, ipoti *it is excreta*, opẽ *it breaks*, oke *he sleeps*, petĩ *tobacco*, ikuã *his finger*, ikua *its hole, it is a hole*, obokõ *he swallows (it)*, oboko *his own purse*, jũ *grass, field*, ju *needle*.

Nasalization is most prominent on the stressed syllable and freely fluctuates with the lack of nasalization on the vowels of weak stressed syllables. Continuant allophones of the complex stops co-occur with nasalization as described in **1.3.1.2.** In rapid speech nasalization occurs with larger grammatical units than the word. In Text 1, words 3 and 4, nasalization occurs with the grammatical slot. In Text 3, words 3 through 4 nasalization occurs with the entire grammatical sentence and across juncture.

2.2. The juncture phonemes[10] signal transition between stress-rhythm units. Onset following juncture is marked by an acceleration of speed. Pause is a feature of juncture. The three juncture phonemes are: / || / [↓] marked by pre-final stress, stress is followed by a sharp fade in stress and pitch; [↑] marked by final stress, stress is accompanied by a pitch rise and sudden fall at end of syllable; pause may or may not be terminal. /// marked by stress with pitch high and sustained, onset following pause is on much lower pitch; pause is non-terminal. /=/ marked by aspiration in free variation with devoicing of final unaccented syllables, occurs utterance final. The co-occurrence of / || / with /=/ is written /#/:

[7] Prosodic nasalization may alternately be treated as syllable final /n/. This solution would result in two additional syllable patterns, -Vn and -CVn, which occur in morpheme final position only.

[8] All texts referred to in this paper are on file in the Archives of Languages of the World, Indiana University.

[9] The prosodic quality of nasalization in Kaiwá was pointed out by F. W. Householder, Jr. Previously six nasal vowels had been postulated, but contrast occurred only in stressed syllable.

[10] In a previous analysis six juncture phonemes were postulated. An initial spectrographic study of pitch in relation to juncture done under Fred Householder revealed data which made the present economy of phonemes possible.

ijaqije-rabõ jaha haqã jaha?agắ # [↑h] ha?agắ-haqã // [↓] (it-ripe when/if we-go purposive we-bless # it-bless purposive //) *When it is ripe, we will go so we can bless it. So that it is blessed.*

pia?e-ke eru / oji haqã // ja?u haqã # [↑] (rapidly-imperative you-bring/it-cooks purposive // we-eat purposive #) *Bring (water) quickly so that it can cook so that we can eat.*

ajatípi ắvati mórotí // [↓] jăha?aga haqắ/(I-plant-in corn white // we-bless purposive/) *I cover the sweet corn (seed) with dirt so we can bless it.*

biabirĩ ojapo juhã # [↑h] obo?a-haqã borevĩ # [↑h] borevi obo?ắ haqã # [↑h] (people-extinct they-make snare-trap # they-cause-fall purposive tapir # tapir they-cause-fall purposive #) *The people of long ago made snare traps so they could trap tapir. So they could trap tapir.*

3. The third emic system of the Kaiwá phonological structure is that of the paralinguistic features of stress and rhythm.

3.1. Two degrees of stress inter-act in Kaiwá discourse.

3.1.1. Lexical stress usually occurs on the stem final syllable of isolation forms: ejuvi *you strangle something*, eju-vi *you come here for a short time*; ajepota *I light a fire*, ajepo-ta *I will jump*. In loan words and some apparently native words stress is on the penult: háša *hatchet*, ója *kettle*, áva *man*.

In context lexical stress is sometimes perturbed. When stress occurs other than word final it is marked by ′.

3.1.2. Sentence stress, marked ″, is illustrated by the following pairs of examples. In each pair cited, the first form occurs in recorded text, the second form was elicited later for study purposes. The placement of stress in the first form indicates that it occurs in normal narrative. The placement of stress in the second form indicates that the speaker was being pedantic.

In part A of the first example, taken from Text 1 (texts are to be published later), sentence stress occurs on the ultimate syllable of the first word. It does not coincide with lexical stress. In part B, sentence stress occurs on the ultimate syllable of the second word and is coincidental with lexical stress. A: ahatắ ajebitĩ // (I-go-action-initiated I-for-myself-plant) *I'm going to go plant.* B: aha-ta ajebitĩ́ #

In part A of the second example, sentence stress occurs on the ultimate syllable of the third word and is simultaneous with lexical stress. In part B, sentence stress occurs on the ultimate syllable of the fifth word and is simultaneous with lexical stress. A: ahata vati ajatí # šé rebitĩ ajáti haqã // (I-go-action-initiated corn I-plant # I possessed-plant I-plant purposive //) *I'm going to go plant corn in order to plant my garden.* B: aha-ta avati ajati še rebitĩ ajati haqã #

In part A of the third example, sentence stress occurs on the penultimate syllable of the fourth word. It does not coincide with lexical stress. In part B, there are two occurrences of sentence stress; the first occurs on the ultimate syllable of the first word; the second occurs on the ultimate syllable of the fourth word. Both are simultaneous with lexical stress. A: erévi?a re tájasu // kắ?ẽ eré?u // (you-happy about wild-boar // roast you-eat //) *In your happiness you eat roast wild pig.* B: erevi?ắ rehe // tajasú ka?ẽ ere?ù //

3.2. A preliminary examination of the stress-rhythm complex of Kaiwá discourse reveals that rhythm is of primary importance in the determination of stress placement.

3.2.1. Although the techniques which the native Kaiwá speaker uses to form a specific rhythm pattern are still unpredictable, it is evident that, consciously or unconsciously, he uses certain devices to attain a rhythm pattern which conveys his emotional overtones to other speakers of the language.

3.2.1.1. Alternate stress placement appears to be controlled by the rhythm pattern. The following differences in stress placement occur in the sample texts. Text 1: word 13, ajáti; words 2, 5, 6, and isolation form ajati *I plant*; word 11, ắvati; word 12

and isolation form avati *corn*; word 4, haqą́; word 9 and isolation form haqã unstressed *purposive*; Text 3: word 9, távitérã; word 10, táviterã; isolation form taviterã, Kaiwá; Text 4, throughout text haqą́.

3.2.1.2. The number of syllables between stresses is altered to fit rhythm patterns.

3.2.1.2.1. An elision of two vowels may occur reducing the number of syllables between sentence stresses.

3.2.1.2.2. Certain vowel clusters are optionally treated as one or two syllables as needed to fit within the rhythm pattern. This is statistically more common among those clusters which are emically two syllables, but phonetically one.

3.2.1.2.3. An additional syllable may be formed by the gemination of the vowel in the penultimate syllable.

3.2.1.2.4. A morpheme may be repeated. In the following example, words 1 and 3 are weak stressed pre-reduplications of the stressed morphemes, words 2 and 4 respectively: še šé kihijẽ́ // še šẽ́ qaivĩ-bã # (I I fear // I I old-woman #) *I'm afraid. I'm an old woman.*

3.2.2. Three distinct stress-rhythm patterns are recurrent in the materials recorded at Panambi. These patterns are modified by change of pitch register and the speed of the utterance, but they occur regularly in the narrative speech of the adults of the entire community. The stress-rhythm patterns are described here in relation to their intricacy.

3.2.2.1. An extremely simple, completely predictable, rhythmic pattern occurs under certain strained situations.[11] The pattern consists of elevating the isolation stress of each word to sentence level stress and pronouncing each word slowly and distinctly.

[11] When a mother has had to repeat an instruction or admonition many times, she terminates the repetitions by one final statement in this rhythm pattern. In dictating speech for study purposes, this pattern is at times used by a super pedantic individual.

3.2.2.2. Normal conversation employs relatively simple rhythmic patterns. In the texts, each grammatical sentence occurs with only one emically placed sentence stress. The presence or absence of one or more of the rhythmic devices results in a variety of stress-rhythm patterns.

3.2.2.3. A highly intricate stress-rhythm pattern also occurs in Kaiwá discourse. This is sharply reminiscent of the more intricate patternings of the poetry of Western European languages. Stress gives a basic beat to the pattern. Sentence stress occurs oftener than once in a grammatical sentence and combines with a profusion of the rhythmic devices.

Text 3, marked as it occurs in its stress-rhythm pattern, is presented here. The line after the text represents the rhythm pattern. - represents a weak stressed syllable. / represents a stressed syllable. . and ′ occur in line 8 representing weak stressed and stressed syllables respectively. In this line the syllables occur in a rapid slur.

1. ko qĩra kádire rupa #-/-/---/; 2. ko jékóakű aba #-//-/-/; 3. jekóakúva kãdire aba #-/-/-/---/; 4. šĩru rare // /--/; 5. sãja aba // /--/; 6. ko kő va?e #-/-/; 7. ipó?orã #-/-/; 8. bã bo?ã réjarũ // ′.″.′; 9. arábĩ orerékohã #-/---/-/; 10. áipó-rabõ #/-/-/; 11. ãravaré arékohá #/--/-/-/; 12. ipórã vã eobő?porã #-/-/-/-/; 13. áipó-rabő // /-/-/; 14. orẽ́vi // -/-; 15. dãi?porã́-i // /--/; 16. arávarẽ́ arékohá #-/-/-/-/; 17. orẽ́ távitérã kuéra #-//-/-/-; 18. táviterá orẽ́ #/--/-/.

Free translation: I'm going to go plant. I'm going to go plant corn in order to plant my garden. I'm going to go plant sweet potatoes, too. I plant yuca. I'm going to my field. I want seed corn to take and plant. Sweet corn. I'm going to go plant sweet corn in my field.

SIMULTANEOUS ORDERINGS IN SIRIONO (GUARANI)

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0. In Siriono[1] the internal ordering of sentences appears to be most coherently describable in terms of two simultaneous, partially independent, yet interlocking systems of organization. One system of organization is conveniently describable in terms of traditional grammatical analysis by immediate constituents or tagmemic constituents. There is at the same time another system of ordering of these constituents into spans that are not completely equatable with the units arrived at by a conventional analysis, but that are characterized by morphophonemic boundary points, enclitic markers, and special groupings of the constituents that are identified in the usual way.

In the following set of sentences[2] the relationship between the constituents is in one sense constant from sentence to sentence: each contains a predicate; most contain an object, a tense marker, and a closure marker; and two contain a subject. In their arrangement, however, there is only a partial tie between the nature of the constituents themselves and their ordering. soo / dea *he found meat*; soo /etea *he found meat*; soo / dea / -ke / -da *he found meat*; soo / -ke // etea / -da *he found meat*; senǫŋe // soo // tea *my brother found meat*; senǫŋe / -ke // soo // tea / -da *my brother found meat*; soo / -ke // senǫŋe // tea / -da *meat my brother found*; tea *he found it*; tea / -ke / -da *he found it*.

In these sentences soo *meat* is the object, dea or (e)tea *find* is the predicate, the enclitic -ke is past tense marker, the enclitic -da is sentence closure marker, and senǫŋe *my brother* is subject. These relationships remain constant throughout the set of sentences. Elements that manifest relationships of this general kind will be called CONSTITUENTS.

[1] A language spoken by about 600 people most of whom live between the Blanco and Mamoré Rivers in northwestern Bolivia. Data for this paper were gathered in the years 1957–1960 during field trips to San Pedro, a small village on the Blanco River. The field trips were made under the auspices of the Summer Institute of Linguistics; the paper was written during attendance at the 1960 Linguistic Workshop of the Summer Institute of Linguistics at the University of Oklahoma.

[2] The phonemes of Siriono are: stops p, b, t, d, k; affricated stop c; fricatives s, š, h; nasals (which have nasal allophones before nasal vowels, nasal-plus-homorganic-voiced-stop allophones before oral vowels) m, n, ñ, ŋ,; semivowels w, y,; vowels i, į, e, ę, u, o, ǫ, a, ą, ɨ (high central internally rounded), į. Stress (unless otherwise written) is penultimate in words of two or more syllables that contain no enclitics, ultimate on words of one syllable. A hyphen indicates that loud stress should be read on the second syllable before it (if there is a second syllable; otherwise on the only syllable before it) and that if there are two or more syllables after it, secondary stress should be read on the next to last of them. Space indicates phonological (as well as grammatical) word boundary (plus juncture). Hyphen before two or more syllables indicates plus juncture but not word boundary.

At the same time it will be noted that -ke, when it occurs, follows either the first constituent in the sentence or (in some cases) the first object-predicate sequence in the sentence. Of the two forms of the predicate, the form dea *find* does not occur initially in the sentence or after -ke, while the form (e)tea *find* occurs both initially and immediately after -ke, as well as in other places. Examination of many more sentences discloses a set of morphophonemic alternations that are characteristic of the beginning of sentences, of the position after -ke (unless only the sentence closure marker follows -ke) and morphemes of its class, and at certain other spots within sentences. The units whose boundaries may be marked by the occurrence of -ke and similar morphemes, or by special morphophonemic phenomena, or by both, will be called SPANS. Boundaries of spans in the examples given below are indicated by double slashes where there is more than one span present.[3]

1. Of the two systems of organization, the one that can be analyzed in terms of constituents presents no special problems as a syntactic description. (The system of organization in terms of spans will be discussed separately under **2.**)

1.1. INDEPENDENT clauses are clauses that can constitute a discourse-initial sentence. The major independent clause types are: declarative, descriptive, and equational. (Dependent clauses will be discussed under **1.5.** Minor independent clause types are outside the scope of this paper.)

The DECLARATIVE clause is characterized by a verbal predicate and by the a- series of personal prefixes (List 1) acting as subject of the predicate. The declarative clause is of two types: transitive and intransitive.

The minimal formula for the transitive clause is TrCl = ±O:Nx + P:TrVbx. The formula is to be read: A transitive clause consists of an optional object slot filled by a nominal (noun or pronoun) expression and an obligatory predicate slot filled by a transitive verb expression. A nominal or verbal expression consists of one or more words that function within the clause as a unit: teasu kasu // erecịọ (*pig big* [object] // *you-kill* [predicate]) *you killed a big pig*; mia // acạnu (*people* [object] // *I hear* [predicate]) *I heard the people*; sirọ (*remove* [predicate]) *he removed it.*

The minimal formula for the intransitive clause is IntrCl = +P:IntrVbx. The formula is to be read: An intransitive clause consists of an obligatory predicate slot filled by an intransitive verb expression: kyadu (*eat* [predicate]) *he ate*; acasu (*I-bathe* [predicate]) *I bathed.*

The DESCRIPTIVE clause is characterized by an adjectival predicate (**3.1.3.**) and by the se- series of subject prefixes acting as subject of the predicate. The minimal formula is DescCl = ±S:Nx + P:Adjx. The formula is to be read: A descriptive clause consists of an optional subject slot filled by a nominal expression and an obligatory predicate slot filled by an adjectival expression. sediaką (*I-hungry* [predicate]) *I'm hungry*; paba / dasi (*father* [subject] / *sick* [predicate]) *Father is sick*, ida / usi tuci (*wood* [subject] / *heavy very* [predicate]) *The wood is very heavy*, eñẹte (*it-small* [predicate]) *it is small.*

The EQUATIONAL clause is characterized by an obligatory subject and an obligatory nominal predicate. The minimal formula is +S:Nx + P:Nx. The formula is to be read: An equational clause consists of an obligatory subject slot filled by a nominal expression and an obligatory predicate slot filled by a nominal expression: ko // huą́ (*that* [subject] // *John* [predicate]) *that is John*, ŋida dọnei // semae ęą (*hen black* [subject] // *my-thing not* [predicate]) *the black hen is not mine*, nediidiŋa // ñaka (*your-son-eater* [subject] // *tiger* [predicate]) *the eater of your son is the tiger.*

In all clause types the predicate constitu-

[3] In the examples throughout this paper, a single slash indicates constituent boundaries and a double slash indicates simultaneously both constituent and span boundaries.

ent is characterized by the optional presence of the negative morpheme.

1.2. All of the constituents mentioned thus far in Section 1 are content constituents. The declarative clauses may be expanded beyond the minimums given to include up to three of the following content constituents: Subject, Time, Location, Dependent Predicate, Dative, Genitive, Direction-Accompaniment, and in the Transitive Clause, Purpose. senǫŋe // soo // mẽę // se-he // kudi (*my-brother* [subject] // *meat* [object] // *give* [predicate] // *to me* [dative] // *yesterday* [time]) *my brother gave me meat yesterday*. The declarative clause may also be expanded to include up to three functional constituents (tense-mode-aspect indicators. See Chart 1 below): taita / -ke // uke / -kya / -da (*Taita* [subject] / *past-tense* // *sleep* [predicate] / *linear-action* / *sentence-closure*) *Taita was sleeping*. The descriptive clause may be expanded to include up to two of the following content constituents: Time, Location, Dative, Genitive, and Direction-Accompaniment. It may also be expanded to include up to three functional constituents: isa / -ke // nąnesikice / -kay // nikyade-si / -da (*at-night* [time] / *past-tense* // *we-afraid* [genitive] / *linear-action* // *of-alligator* [genitive] / *sentence-closure*) *we were afraid of alligators* (*last*) *night*. The equational clause is unexpandable.

In all clause types, the subject constituent, the predicate constituent, and in the transitive declarative clause, the object constituent, are nuclear constituents. All other content constituents are satellite constituents. No one clause may have more than two satellite constituents.

1.3. The normal order of occurrence of nuclear constituents is Subject-Object-Predicate, but the object may (for emphasis) precede the subject. Nuclear constituents are never separated from each other by satellite constituents (but may be separated by functional constituents). Satellite constituents, unless emphasized, may not occur preceding the nuclear constituents. A single emphasized satellite constituent may precede the nucleus, unless in the nucleus the object precedes the subject.

1.4. Any content constituent may be a single word (plus the dative, genitive, and direction-accompaniment enclitics that obligatorily mark those constituents), or it may be expanded to include several words. The two pairs of sentences which follow will illustrate this expansion. edike *its-trail* / -ke *P.T.* // atea *I-find* / -da *C. I found its trail*; teasu dike *pig trail* / -ke *P.T.* // atea *I find* / -da *C. I found pig trails*; neseo *cry* / -ke *P.T.* / -da *C. He cried*; neseo-seo tuci *cry cry much* / -ke *P.T.* / -da *C. He cried and cried a lot.* (*P.T.* ≡ *past tense.*)

In the first pair of sentences the constituents are object—past tense—predicate—closure. The object constituent of the second sentence is an expansion of edike *its trail*: teasu dike *pig trails*. In the second set of sentences, the predicate constituent of the second sentence is an expansion of neseo *cry*: neseo-seo tuci *cry and cry much*. Other constituents may be expanded in a similar way.

1.5. There are some complex constituents[4] of clauses which themselves contain clauses. Such a complex constituent is the declarative noun clause, which consists of a dependent clause followed by ake *that one* or ukį *those*. (No dependent clause can have the sentence closure marker -da.) The noun clause fills any slot filled by a nominal expression: kyadu -ke kudi a ukį / -na // ñebi (*the ones who ate here yesterday, those* [subject] / *future* // *return* [predicate]) *the ones who ate here yesterday will return*, ñasu nedese ake-he // amẽę (*the one who bathed with you, to that one* [dative] // *I-give* [predicate]) *I give it to the one who bathed with you.*

A second type of complex constituent is the descriptive noun clause, which consists of a dependent clause containing an adjectival predicate. The descriptive noun clause cannot contain functional constituents. The

[4] There are several minor types of complex constituents which have not yet been analyzed, but each of which, like the types mentioned, fills one constituent slot in clauses.

descriptive noun clause fills any slot filled by a nominal expression: ñaka dasi / -ke // kutu-kutu / -da (*tiger sick* [subject] / *past tense // howl-howl* [predicate] / *closure*) *the tiger that was sick howled*, amąę / -ŋe // ñędemǫ oko-dese / -da (*I-look* [predicate] / *past tense // two long at* [direction-accompaniment] / *closure*) *I looked at two long ones.*

A third type of complex constituent is the Locative Clause I, which is a dependent clause followed by we *there* (*a place known to the hearer*) or by pe *there* (*a place not known to the hearer*). Locative Clause I fills the location slot: eduba -ke aciǫ pe / -ke // ñebi / -da (*I shot the monkey, there* [locative] / *past tense // turn back* [predicate] / *closure*) *he turned back where I shot the monkey*, edekoi we // edemukyaca (*you fell, there* [locative] // *you-cause-to be lost* [predicate]) *you lost it where you fell.*

A fourth type of complex constituent is the Locative Clause II which is characterized by the location indicator -sa suffixed to the verb of a dependent clause. Locative Clause II cannot contain functional constituents. Locative Clause II fills the location slot: ñaka-dese ñǫñǫ mąęsa / -ke // oso / -da (*where the dog saw the tiger* [location] / *past tense // he-go* [predicate] / *closure*) *he went where the dog saw the tiger*, nąnekesa / -da // acao (*where we sleep* [location] / *future tense // I-make* [predicate]) *I'm going to make it* (*house*) *where we slept.*

A fifth type of complex constituent is the temporal clause, which is characterized by the suffix -de *after* on the verb, or by one of two verbal clitics -mǫse *when, if* and -nǫne *before,* following the verb of the dependent clause. (-mǫse *when, if* is used in what can be translated as conditional clauses, but since there is no diagnostic difference between temporal and conditional clauses, no conditional clause is set up as distinct from the temporal clause.) The temporal clause cannot contain functional constituents. The temporal clause fills the time slot: sedïïdį mąnǫ-nǫne / -ke // idásei / -da (*before my son died* [time] / *past tense // sing* [predicate] / *closure*) *before my son died, he sang*, mia kyadude // uke (*after people eat* [time] *sleep* [predicate]) *after people eat, they sleep*, ibido męę-mǫse se-he / -da // sedasi (*when, if he gives me chocolate* [time] / *future tense // I-sick* [predicate]) *when, if he gives me chocolate, I'll be sick.*

A sixth type of complex constituent is the direct quotation. It is the object in a transitive clause of which some form of **i** *to do, say* is the verb: ñaka -ke nedïïdį u -da / **i** / -ke / -da (*the tiger ate your son* [object] / *say* [predicate] / *past tense / closure*) *"The tiger ate your son," he said*, aso ęą -na kuri / ae / -da // paba -he (*I'm not going tomorrow* [object] / *I-say* [predicate] / *future tense // to father* [dative]) *"I'm not going tomorrow," I'm going to say to Father.*

In the above examples, as in all utterances containing direct quotations, the quotation alone could be considered as an independent utterance and could be analyzed according to its constituents. In the first example above, the quotation ñaka -ke nedïïdį u -da *the tiger ate your son* is the complex filler of the object slot. But the quotation itself may be analyzed as a clause that contains five constituents: subject—past tense—object—predicate—closure.

Each example of complex constituents given here could be further divided into constituents at a lower level, but that is beyond the purpose of this paper.

2. Of the two systems of organization of Siriono, the one that can be analyzed in terms of constituents does not account for all syntactic phenomena. A further system of organization, which must be stated in less conventional terms, is necessary. This second system, stated in terms of spans, is partially independent of, and partially dependent upon, the system of constituents. Consequently the span analysis will be made partially in terms of constituents and combinations of constituents. (See also **2.2.**)

2.1. Spans are of special importance in that they are the basis for explaining: (1) the position in the sentence of certain functional (tense-mode-aspect) enclitics; and

(2) certain morphophonemic alternations. Spans are also useful in stating (3) the ordering of content constituents. This ordering will be discussed in Section **2.2.**

2.1.1. Of the functional enclitics, mention will be made in this paper of only a few of the most-used ones. Those mentioned are representative of all other functional enclitics in the language. The past tense is signalled by the unattested past tense enclitic -na (which indicates that the speaker was not a witness to what is reported), or by the general past tense enclitic -ke (attested and unattested). The future tense is signalled by the enclitic -da. These enclitics -na, -ke, and -da are mutually exclusive and occur only in the first span of the sentence. Linear action is signalled by the enclitic -kya. When neither -na, -ke, nor -da occur, -kya may occur only in the first or second span of the sentence. When either -na, -ke, or -da occur, -kya may occur only in the second or last span. For these relationships, see Chart 1. When any of these enclitics occur, they occur as enclitic to the last word of the span of which they are a part: ñaka dąmį / -na // eidasa / -da (*tiger male* [subject] / *past tense* // *cross* [predicate] / *closure*) *the male tiger crossed it*, ñęęna -duị / -ke // oso // ñeseo / -da (*down trail* [locative] / *past tense* // *go* [predicate] // *cry* [dependent predicate] / *closure*) *he went down the trail crying.*

2.1.2. There are two types of morphophonemic alternations which can best be explained in terms of spans. The first type of morphophonemic alternation is as follows: /d/ becomes /n/ and /b/ becomes /m/ in SPAN INITIAL.[5] Note in the following examples the morphemes de (∼ne) *you*, dąmọ (∼nąmọ) *now or immediately*, bebe (∼mebe) *fly*, and baba (∼maba) *charge* when they occur in span initial. Note also that there is no change in the morphemes dọnei *black*, dïidį *son*, bei *always*, -da *closure marker*, and -de question marker, since they do not occur in span initial: aidásei bei / -da // ne -he (*I-sing always* [predicate] / *future tense* // *for you* [dative]) *I will always sing for you*, tu / -ke // nąmọ // sedea + -da (*come* [predicate] / *past tense* // *now* [time] / *me-see* [dependent predicate] / *closure*) *he came now to see me*, nąmu / -ke // mebe // ida dọnei -si / -da (*dove* [subject] / *past tense* // *fly* [predicate] // *from black tree* [genitive] / *closure*) *the dove flew from the black tree*, tikasu / -ke // maba // se-he / -da (*cow* [subject] / *past tense* // *charge* [predicate] // *at me* [dative] / *closure*) *the cow charged at me*, adedekya tuci (*I-you-hunt much* [predicate]) *I hunted you a lot*, señọda dïidį // sekyato (*lady's son* [subject] // *my-friend* [predicate]) *the lady's son is my friend*, edebebe // abio -ye / -de (*you fly* [predicate] // *in airplane* [locative] / *question marker*) *did you fly in the airplane*? oso dąmọ / -ŋe // kyadu / -da (*go immediately* [predicate] / *past tense* // eat [dependent predicate] / *closure*) *he immediately went to eat.* These alternations were especially important in arriving at the decision to treat Siriono syntax as involving two simultaneous orderings.

The second type of morphophonemic alternation that can best be explained in terms of spans is as follows: several functional enclitics have two allomorphs, the first of which is used in sentences of one span that contain no other functional enclitic, and the second of which is used elsewhere. Most of these are sentence final enclitics.

The question marker is -ede∼ - de: oso / -ede (*go* [predicate] / *question marker*) *did he go*? (one span), ecobe // oso // suca kasu / -de (*Echobe* [subject] // *go* [predicate] // *big house* (*town*) [location] / *question marker*) *did Echobe go ?* (*two spans*).

-ñedesẹ ∼ -desẹ is a functional enclitic meaning "obviously": sekenẹą / -ñedesẹ (*I-tired* [predicate] / *obviously*) *obviously I'm tired* (one span), tekenẹą // ne -si / -desẹ (*I-tired* [predicate] // *than you* [genitive] /

[5] The phonemes /b/, /d/, /c/, and /k/ become /m/, /n/, /ñ/, and /ŋ/ following a nasal, but this part of the morphophonemics is not pertinent to this paper.

obviously) *obviously I'm more tired than you* (two spans).

-edeae ~ -deae is a functional enclitic meaning "in my opinion": edecabi / -edeae (*you-miss* [predicate] / *in my opinion*) *I think you missed* (one span), teasu // edecabi / -deae (*pig* [object] *you-miss* [predicate] / *in my opinion*) *I think you missed the pig* (two spans).

One of these enclitics is a Span One enclitic. This is the future tense marker -dae ~ -da: ñaaki / -dae (*rain* [predicate] / *future tense*) *it's going to rain* (one span), ne -he / -da // ñaaki (*on or to you* [dative] / *future tense // rain* [predicate]) *It's going to rain on you* (two spans).

In one-span sentences that contain two functional enclitics, the second allomorph of the morphemes mentioned above occurs: kyadu / -kya / -de (*eat* [predicate]/ *linear action / question marker*) *is he eating?* mesa / -da / -deae (*write* [predicate] / *future tense / I think*) *he's going to write I think.*

2.2. There are two major differences between the constituent and the span. The first difference is that functional constituents always combine with the preceding content constituent (or close-knit unit of two content constituents) in a single span. Note that in the following examples each of the enclitics -ke, -da, and -deae (though each is a separate and complete constituent as far as clauses are concerned) combines with the preceding content constituent in a single span: secucua yasu / -ke // acao / -da (*my-house new* [object] / *past tense // I-make* [predicate] / *closure*) *I made my new house,* edasi // itǫnadu / -deae (*he-sick* [predicate] // *at night* [time] / *I think*) *he was sick last night, I think.*

The second major difference between the constituent and the span is that certain sequences of two content constituents may combine to form a single span. These sequences are: (a) Subject-Descriptive Predicate, (b) Subject-Intransitive Predicate, and (c) Object-Transitive Predicate.

The subject and descriptive predicate are always a close-knit unit forming (or when followed immediately by a functional constituent, helping to form) one span: ibasi / kasu / -da // kote / -deae (*corn* [subject] / *big* [predicate] / *future tense // now* [time] / *I think*) *the corn is going to be big now, I think,* tataba / daku // se -he (*fire-ash* [subject] / *hot* [predicate] // *to-me* [dative]) *the ashes were hot to me,* udea / boko / -ke / -da (*our-hair* [subject] / *long* [predicate] / *past tense / closure*) *our hair is long.*

When the first span of a sentence includes a satellite constituent and an intransitive verb is used in the predicate constituent, the subject (if it occurs) and the intransitive verb combine to form a close-knit unit forming (or when followed immediately by a functional constituent, helping to form) one span: idao-dese / -ke // mąsi / diki / -da (*with honey* [direction-accompaniment] / *past tense // Masi* [subject] / *to be* [predicate] / *closure*) *Masi was with the honey,* ąmąni kasu dóbei / -ke // paba / kyadu / -da (*other side of big water, lake* [locative] / *past tense // Father* [subject] / *eat* [predicate] / *closure*) *Father ate on the other side of the lake.*

When no subject is expressed, the object and a two or three-part transitive verb (**3.1.1.**) may combine to form a close-knit unit forming (or when followed by a functional constituent, helping to form) one span: ŋida / diboo / -dae (*chicken* [object] / *pick* [predicate] / *future tense*) *he will pick the chicken,* kiiką / įǫ / -na // kudi / -da (*deer* [object] / *shoot* [predicate] / *past tense / yesterday* [time] / *closure*) *he shot a deer yesterday,* itǫnadu // ñęęna / desae (*at night* [time] // *trail* [object] / *illumine* [predicate]) *at night he illumines the trail.*

2.3. The order of occurrence of spans within the sentence is indicated by the following formula, in which the occurrence of a higher-numbered span implies the occurrence of all lower-numbered spans: $+ \text{I}{:}C_1 \pm \text{III}{:}C_3 \pm \text{IV}{:}C_4 \pm \text{V}{:}C_5 \pm \text{II}{:}C_2$; C_1 = content constituent or a close-knit unit of two content constituents (as described in **2.2.**) ± a functional constituent (Chart 1) ± another functional constituent if there is no

span II; C_3 = content constituent or a close-knit unit of two content constituents ± a functional constituent; C_4 = content constituent; C_5 = content constituent; C_2 = Content constituent (or close-knit unit of two content constituents if neither III, IV, nor V occur) ± functional constituent.

Two restrictions accompany this formula. First, no arrangement of content constituents is allowed that contradicts the arrangement of content constituents as described in **1.3.** Second, no arrangement of functional constituents is allowed that contradicts the arrangements of functional constituents in List 1. With these two restrictions, the formula is assumed to be complete.

CHART 1: Given the patterns of occurrence of content constituents stated above, specific functional constituents can occur at the ends of spans as follows:

I, III-kya, IV, V, II.
I⟨-ke⟩, III-kya, IV, V, II-da_1.
I⟨-ke⟩, III, IV, V, II-da_1 .
I-kya, III, IV, V, II-da_1 .
I-kya, III, IV, V, II.
I-da_2 , III-kya, IV, V, II.
I⟨-ke⟩-da_1 .
I⟨-ke⟩, II-kya -da_1 .
I-da_2 , III, IV, V, II⟨-de⟩.
I, III, IV, V, II⟨-de⟩.
I⟨-ede⟩.
I-da_2 ⟨-de⟩.
I-dae.

In the preceding chart, -ke *past tense marker*; -da_1 *sentence closure marker of past tense sentence*; -kya *linear action marker*; -da_2 ∼ -dae *future tense marker*; -de∼-ede *question marker*. Diamond brackets ⟨⟩ indicate that there are still other functional enclitics that are substitutable in any location for the one in brackets.

3. All word classes are mentioned in this section, and the transitive and intransitive verbs are treated extensively since they are syntactically most relevant to the simultaneous orderings of the language.

3.1. Siriono verbs are of three major classes, transitive, intransitive, and adjectival.

3.1.1. The transitive verbs are divided into three classes: those that have three principal parts, those that have two, and those that have one principal part. The principal parts are sets of systematically related stems.

3.1.1.1. The stems of three-part verbs are the basic stem, the shifted stem, and the apocopated stem. The BASIC stem has /k/ as its initial phoneme and /d/ as its second consonant: EKEDAO *he takes*, EKEDU *he brings*, EKUDUCI *he lowers*. The SHIFTED stem changes the initial /k/ to /d/: aba NEDEDU-de *who brought you*? oso-ke EDEDAO-da *he went, taking it*. The APOCOPATED stem drops the first syllable (ke, ku, or ki): ADAOą na-se *I'm not going to take it*, EDEDU-ede *did you bring it*?

The basic stem of three-part verbs indicates that the verb is the main verb of a clause, and that the subject and object are third person, whether stated outside the verb or not: sedu-ke ibido KEDU-da *my husband brought the chocolate*, paba-ke EKEDAO-da *Father took it*.

The shifted stem occurs in any of the following instances: (a) when the object of the verb is not third person (i.e., first or second person singular or plural): se-da SEDEDU-de *are you going to bring me*? aba NEDEDU-de *who brought you*? NEDEDAO sakwą ęą aču ŋią *I didn't come to take you*; (b) when the verb is in a dependent clause regardless of the person of subject or object: EDEDU dese-ke amąę-na *I saw it being brought*, ne ibido DEDU-mose ede *was it when you brought the chocolate*? teasu kyąę NEDU-DEDU dake *the baked pig was brought*; (c) when the verb is an auxiliary verb regardless of the person of subject or object: taso EDEDU *I'm going to bring it*, aiko EDEDU-DEDU a-desę *I'm here bringing it, obviously*, sedu-ke oso ibido DEDU-da *my husband went to bring chocolate*; (d) when there is emphasis on the object constituent or on a satellite constituent: pe-da paba DEDU *Father is going to take*

it there, manose miletón EDEDU-de *when did Mileton bring it?*

The apocopated stem of three-part verbs occurs when the subject is not third person and the object is third person (singular or plural): ADAOą na-se *I'm not going to take it*, heno-ke udeDAO-da *we took the leaves*, EDEDU-ede *did you bring it?*

3.1.1.2. The stems of two-part verbs are the basic stem and the nonbasic stem. Nonbasic stems are of three types: those that shift the initial phoneme, those that drop the initial phoneme, and those that drop the initial syllable.

Verbs that shift their initial phoneme to form the nonbasic stem are divided into two groups: (a) those that shift from basic /s/ to nonbasic /d/: nanesAADǫ nąhę (basic) *let's wait*, adeDAADǫ na-se (nonbasic) *I'm going to wait for you*; and (b) those that shift from basic /t/ to nonbasic /d/: ñedemǫ-ŋe ATEA-da (basic) *I found two*, kudi-da EDEA (nonbasic) *tomorrow he will see it.*

Verbs that drop the initial phoneme to form the nonbasic stem include: tacIǫ (basic) *I intend to shoot it*, adęIǫ (nonbasic) *I'm going to shoot you*; tacAO (basic) *I intend to make it*, mae AO-AO ha (nonbasic) *He made everything.*

Verbs that drop the initial syllable to form the nonbasic stem include: neko-kya acuKą-na (basic) *I passed your field*, seKą ŋe-da (nonbasic) *he passed me*; tacISIA (basic) *I intend to cut it*, taso esIA (nonbasic) *I'm going to go cut it.*

The basic stem is used when the verb is the main verb of a clause and its object is third person and does not precede it in a close-knit span. If the emphasis is not to be laid on the subject constituent, but rather on the object constituent or on a satellite constituent, then the nonbasic stem is used: mia-ke ñu cIǫ-na (basic) *the thorns stuck the people*, mia-ke ñu Iǫ-na (nonbasic) *the people were stuck by the thorns*; manose hęhę niṇisi SECA-de (basic) *when did Hehe leave his wife?* manose hęhę niṇisi DECA-de (nonbasic) *when did Hehe leave his wife?* If only one noun that could be interpreted as either the subject or the object constituent (but not both) occurs, the basic stem indicates that the noun is to be taken as subject; the nonbasic, as object: masi eSEKYA (basic) *Masi looked for him*, masi DEKYA (nonbasic) *he looked for Masi.*

In the following cases the nonbasic stem of two-part verbs is used automatically: (a) when the verb has some person other than third person as object: udeDEKYA-ede *was he looking for us?* seMṴMA-ke-da *he woke me*, adeANU ke-se-da *I heard you*; (b) when the verb is in a dependent clause: se EDEKYA-mose ke akyacą-na *when I was looking for him I got lost*, ki DEA-DEA mose *when he was looking for lice*, sęIǫ-mose *when it stuck me*; (c) when the verb is an auxiliary: aiko EDUI a *I'm here lifting it*, udeso-ke EDEA-da *we went to look at it*, seduu-ke adao teasu Iǫ-na *I took my arrows to kill the pig;* (d) when the object and verb are in a close-knit span (**2.2.**): ecobe DECA-ke-da *he left Echobe*, ibido DEA-ke oso-da *he went to look for chocolate*, mae AO-AO ha *he made everything.*

3.1.1.3. Transitive verbs with one principal part take pronoun prefixes as subject or object as do the other transitive verbs, but are completely ambiguous as to third person reference and dependent or auxiliary status: nąnešuu-ke-da *it bit us* or *we bit it*, masi-ke emǫmo-da *Masi threw him out* or *he threw Masi out.*

3.1.1.4. Personal prefixes of verbs are interpreted as subject or object according to the principal part of the verb with which they occur. For some purposes (**1.1.**) the prefixes can be distinguished as *a- series* or *se- series*:

LIST 1, a- series of personal prefixes: singular: a- *first person*, ede- *second person*, (e-) *third person*; plural: nąne- *first person inclusive*, ude *first person exclusive*, hę *second person*, (e-) *third person.*

LIST 2, se- series of personal prefixes: singular: se- *first person*, de- *second person*, e- *third person*; plural: nąne- *first person*

inclusive, ude- *first person exclusive*, hę- *second person*, e- *third person*.

With the basic stem of a two-part verb or with the apocopated stem of a three-part verb, the non-third person prefixes a- *I* first singular, ede- *you* second singular, nąne- *we or I and you* first plural inclusive, ude- *we, not you* first plural exclusive, and hę- *you-all* second plural are interpreted as subject acting upon third person object. ADAOĄ na-se *I'm not going to take it*, maedą EDEdao-de *why did you take it*? UDEsaadǫ mei *we waited for him for a long time*, HĘsekya ede *did you-all look for it*?

The non-third person prefixes are interpreted as object when they occur with the nonbasic stem of a two-part verb or with the shifted stem of a three-part verb. The prefixed object, however, is se- *me* and ne- (word initially)~ de- (following another prefix) *you*; the rest of the series remain the same. SEdeca-ke-da *he left me*, UDEdaadǫ mbei-ke-da *he waited for us for a long time*, NEdeča-ede *did he leave you*? aba NEdedu-de *who brought you*? HĘnei-ede *did it burn you-all*?

For first person singular subject with a nonbasic or shifted stem the prefix a- precedes the other prefix that normally accompanies a nonbasic or shifted stem as object indicator, but no subject category other than first singular is marked within the verb when the object is also marked. ADEdaadǫ na-se *I'm going to wait for you*, TADĘĮǪ *I intend to stick you*. When a- is followed by hę- second person plural object, the h drops. tąĘnaado *I intend to wait for you-all*.

With a nonbasic or shifted stem the subject is implicitly third person unless otherwise marked. Non-third-person subject may, however, be indicated by a free pronoun elsewhere in the sentence. NE cǫ ededu-de *was it you who brought it*? SE siņña dekyamose *when I was looking for the knife*. Second singular subject acting on first singular object (*you* acting on *me*) is indicated anomalously by a first singular free pronoun elsewhere in the sentence together with the first singular object prefix se- (i.e. a combination that would normally be interpreted as *I* acting on *me*; the expected combination *you-me* does not occur). SEmųma ke-SE-da *you woke me*, SEkañǫ na-SE-de *are you going to pass me*? Third person subject may also be indicated by a free pronoun elsewhere in the sentence. AE udeduu dikiokao ñą kote *he broke our arrows now*.

With one-part verbs *I* and *you* can be interpreted unambiguously as subject (a-, ede-) or object (se-, ne- ~ de-), but the other non-third-person prefixes are ambiguously interpreted. Intentive t- may precede either a- or ede- (but not se- or ne-) with all verbs: TAdao *I intend to take it*, TEDEdao *you are to take it*.

The third person pronoun e- is prefixed to the verb as subject or object indicator under the following conditions: (a) when the subject appears in the first span and there is no external object, e- is prefixed to the verb as object: ÑǪÑǪ-ŋe EMųmita ude-he-da *the dog chased it for us*, HĘHĘ-ŋe EcįǪ-na *Hehe shot it*, PABA-ke Ekedao-da *Father took it*; (b) when the object occurs in the first span and the verb in the second, e- is prefixed to the verb as subject: UCIA-ke EMua-da *she laid her egg*, ibaši-ke Etea kuri-da *he found the corn yesterday*, UKISA-ke Ekedao-da *he took his hammock*; (c) when a satellite constituent (**1.2.**) fills the first span, e- is prefixed to the verb as subject or object: KUDI-da Edea *tomorrow he will see it*, NĄMǪ-na Edekya-da *he looked for it now*; (d) when the verb is in a dependent clause and the object and verb are not close-knit, e- is prefixed to the verb: Edidǫ-nese-ke amąę-na *I saw it being taken out*, se ĘĮǪ-mose-ke ñeseo-da *when I stuck him he cried*; (e) when the transitive verb is auxiliary and the object and verb are not close-knit; aiko Edui a *I'm here lifting it*, oso-ke ĘĮǪ-na *he went and shot it*, Edekya-ke udeso-da *we went looking for it*.

Under the following conditions e- does not occur: (a) when the object and the verb are a close-knit unit: N̰U-DEKYA ke-da *he looked*

for his father, EATO-ŠUU *he bit the back of his neck*, MAE-AO-AO ha *he made everything*; (b) when both the subject and the object are expressed outside the verb: NIOI-ke PABLO kedu-da *Pablo brought yuca*, MITO-na ÑASI cịọ tuči-da *the moon shot the mutun (bird) good*, SEDU-ke IBIDO kecu-da *my husband brought chocolate*.

3.1.2. The regular intransitive verbs are divided into three classes:[6] those that have an invariant stem, those that drop the first vowel when a non-third-person pronoun is subject, and the i verbs. The a- set of pronouns used with transitive verbs are also used with intransitive verbs.

The intransitive verbs that have an invariant stem are conjugated as follows: first singular aceseo *I cry*; second singular edeceseo *you cry*; third singular ñeseo *he cries*; first plural inclusive nąneceseo *we-all cry*; first plural exclusive udeceseo *we, not you cry*; second plural hęñeseo *you-all cry*; third plural ñeseo *they cry*.

Those verbs that drop the first vowel in the first and second person are conjugated as follows: first singular acą *I run*; second singular edecą *you run*; third singular ucą *he runs*; first plural inclusive nąnecą *we-all run*; first plural exclusive udecą *we, not you run*; second plural hęñą *you-all run*; third plural ucą *they run*.

The i verbs consist of a preverb plus an inflected nucleus. The preverb never occurs without its nucleus. The nucleus, however, may stand alone, meaning *do* or *say*. In this class of verb the nucleus is the part conjugated. Although some of the forms are identical in form with the free pronouns, in this construction they function as both pronominal prefix and verbal nucleus simultaneously: first singular pama ae *I'm angry*; second singular pama ede *you're angry*; third singular pama i *he's angry*; first plural inclusive pama nąne *we-all are angry*; first plural exclusive pama ude *we, not you are angry*; second plural pama hę *you-all are angry*; third plural pama i *they're angry*.

3.1.3. The adjectival verb has as its subject either a member of the se- series of personal prefixes: eoko *it is long*, neturą *you are good*, sekidi *I am dizzy*; or a noun: mia ata *the people are many*, secucua turą *my house is pretty*; see also descriptive noun, clause, (**1.5**).

3.2. There is a class of nouns, which is divided into two subclasses: non-possessed nouns: ida *wood or stick*, tena *sun*, ñeena *trail*, mei *snake*, soo *meat*; and obligatorily possessed nouns: eciba *his arm*, esi *his mother*, ecucua *his house*, edoo *his flesh*, eai *its end or point*. Obligatorily possessed nouns are possessed either by another noun: ida ai *point of stick*; or by the se- series (List 2) of personal prefixes: seciba *my arm*, nąnecucua *our house*.

There is a class of pronouns whose membership is as follows: se *I or me*, nąne *we or us* (inclusive), ude *we or us* (exclusive), ne *you* (singular), hę *you* (plural), and ae *he, she, it, they, him, her*, or *them*.

There is a class of temporals: isa *at night*, kose *a long time ago or in the far distant future (much time removed)*, kudi *yesterday or tomorrow (one day removed)*, isamami *early morning*.

There is a class of locatives: a *here*, sobei *on the other side*, išo *far away*, pe *there (a place not known to the hearer)*.

There is a class of adverbs: asi *fast*, hai *at once*, bei *always*, hii *again*, which modify and immediately follow the verb.

There is a class of intensifiers: tuci *very much*, rete *exactly*, hiri *a little, almost*, which modify and immediately follow a noun, temporal, locative, adverb, or verb.

[6] There is a small class of irregular intransitive verbs no two members of which possess the same irregularities. These verbs are not discussed here. There is also a small group of verbs whose syllable pattern changes. Because of lack of data, these will not be discussed.

DIFFERENT-LEVEL TENSE MARKERS IN GUARANÍ

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0. Introduction
1. Levels in verb structure
1.1. Derivation for habitual tense
1.2. Inflection for past tense
2. Phrase level for future tense
3. Complex phrase for continuative tense

0. In Bolivian Guaraní[1] there are four tense markers, each occurring on a different level of the hierarchical structuring of the verb and verb phrase. The habitual tense morpheme is a suffix occurring within the verb stem on the derivational level. The past tense morpheme is a suffix occurring within the verb on the inflectional level. The future tense morpheme is an enclitic occurring on the verb phrase level. The continuative is a word occurring on the complex verb phrase level.

In this paper the distribution of the tense markers is presented along with a background study of the structure of the verb phrase.

1. There are two classes of verb bases: transitive and intransitive. Transitive base occurs as head of transitive verbs. Intransitive base occurs as head of intransitive verbs.

Transitive and intransitive verbs are differentiated by internal and external distribution. Internally they differ (1) in the class which occupies the head slot (except for a very small sub-class of roots which are members of both classes), (2) in that transitive person prefixes have double semantic components of subject and object whereas intransitive person prefixes have a single semantic component of subject, and (3) in that certain person prefixes occur only with transitives, others only with intransitives. Externally, transitive verbs occur in transitive clauses, which have optional object, whereas intransitive verbs occur in intransitive clauses, which never contain object.

A verb base may be comprised of: in minimum form, a root. -ñuka[2] *kill*, oñuka *he killed him*; -g^{w}ata *walk*, og^{w}ata *he walks/walked*,[3] in non-minimum form, (1) a stem: -nąmipoka *twist ear* (-nąmi *ear*, -poka *twist*), oinamipoka *he twisted his ear*, (2) a total base (consisting of root or stem + prefix Pr I, prefix Pr II and Su I occurring singly or in combination): -ñeñuka *kill oneself* (-ñe-*reflexive*), oñeñuka *he killed himself*; -ñęnąmipoka *twist one's own ear*, ǫñęñąmipoka *he*

[1] Bolivian Guaraní is spoken by 15,000 Indians living mainly between the Grande and Pilcomayo Rivers in the south-eastern part of Bolivia, South America. There are three main dialect areas. The linguistic data on which this paper is based were gathered during a residence of a year and a half, between October 1957 and March 1960, in a village located in the geographically central dialect area.

Bolivian Guaraní is a member of the Tupi-Guaraní language family. Comparison of lexicon by Sarah Gudschinsky of the Summer Institute of Linguistics indicates that the dialect of Guaraní which is the subject of this paper is more widely divergent from the Guaraní which is spoken in Paraguay than is Portuguese from Spanish.

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[2] The following are the tentative phonemes of Guaraní: p, t, k, ʔ, g^{w}, s, h, β, č, m, n, ñ, ŋ, ř, i, e, a, o, u, ĩ, į, ę, ą, ǫ, ų, ĩ. When m, n, ñ, ŋ occur before non-nasal vowels they are phonetically mb, nd, ǰ, ŋg. Stress usually occurs on the penultimate syllable of the word except when the final syllable contains a diphthong, in which case stress occurs on it. Otherwise stress is marked v́.

[3] The form og^{w}ata means either *he walked* or *he walks*. That is, the tense of a verb when no tense marker occurs is neither only *past* nor only present: it is *non-future*. When, however, a verb is imperative, its tense is inherently *future* and none of the tense markers occur with it.

twisted his own ear, -ñukauka *cause someone to kill someone* (-uka *causative*), oñukauka *he caused (him) to kill him.*

The stem is obtained by derivation; the total base by inflection with or without derivation. Thus a minimum stem, a root, is a minimum verb base; a non-minimum stem is a derived verb base; a total base is an inflected verb base. The obligatory inflectional person prefix occurs prefixed to the verb base; the optional past tense suffix (Su II) may occur suffixed to the verb base. Thus verb = person prefix + verb base ± Su II. Minimum verb base: -ñeapa *be folded*, oñeapa *it is folded.* Derived verb base: -ñeapañeře *roll over* (-ñeře *go around*), oñeapañeře *he rolled over.* Inflected verb base: -moñeapañere *cause to roll over* (-mo- *causative*), ǫmoñeapañeře *he rolled it over.*

1.1. Stems are derived from roots in nine ways. In one of these the habitual tense suffix -se occurs with an intransitive verb root to form an intransitive stem. -g^{w}atase *habitually walk* (-g^{w}ata *walk*), ig^{w}atase *he habitually walks.* -se may also occur with an intransitive total base to form a complex intransitive stem (complex in having more than two morphemes), in which case a higher level structure (a total base) occurs within a lower level structure (a stem), just as, in syntactic analysis, it is possible for a clause to occur within a phrase. -ñęmǫąkĭse *habitually wet oneself* (speaking of a child) (-ñe-[4] *reflexive*, -mo- *causative*, -ąkĭ *be wet*), ĭñęmǫąkĭse *he habitually wets himself.*

Other types of stem derivation are:

(1) Verb root + verb root -ñeapañeře *roll over* (-ñeapa *be folded*, -ñeře *go around* -kařupoi *finish eating* (-kařu *eat*, -poi *let go*).

(2) Noun root + verb root -nąmipoka *twist ear* (-nąmi *ear*, -poka *twist*); -ñuřupĭte *kiss* (-ñuřu *mouth*, -pĭte *suck*).

(3) Morpheme -mo- + Spanish verb.[5] -mokueta *cost* (Sp. cuesta *it costs*); -mǫŋana *earn* (Sp. gana *he earns*).

(4) Reduplication -pǫβąpǫβą *spin from time to time* (-pǫβą *spin*); -g^{w}atag^{w}ata *walk to and fro* (-g^{w}ata *walk*).

(5) Inflectional prefix + noun[6] -ñoapĭ *join together* (-ño- + -apĭ, iñapĭ *its end*); -moapĭ *come to the end* (-mo- + -apĭ).

(6) Possessed noun -čekĭse *my knife* (če- *my* kĭse *knife*) tačekĭse *I shall have a knife*; -čeĭke *my side* (če- *my* -ĭke *side*) tačeĭke *I will turn on my side.*

(7) Noun -kuimae (kuimae *man*) ikuimae (ñae) *he is (very) manly.*

(8) Morpheme -mae- + verb[7] -maeřasĭ *be sick* (-asĭ *hurt*).

1.2. Transitive roots and stems are subclassified according to the sets of person prefixes with which they occur. Transitive roots and stems of subclass 1 (TS1) occur with person prefix sets Ia and Ib: oñuka(o- +-ñuka) *he killed him.* Transitive roots and stems of subclass 2 (TS2) occur with person prefix sets IIa and IIb: ǫĭ̃nupą (oi- + -nupą) *he hit him.*

Intransitive roots and stems are subclassified according to the sets of person

[4] All prefixes have phonologically conditioned allomorphs: an allomorph containing nasal vowel occurs preceding a verb base of which the first syllable is nasal; one with oral vowel occurs preceding a verb base of which the first syllable is non-nasal (a syllable is nasal if it begins with nasal consonant or contains nasal vowel). For simplicity, in the morpheme breakdowns (within parenthesis) and in listing the prefixes, only the allomorph with oral vowel is written. Person prefixes of sets Ia, Ib, A, B which terminate in -o- have phonologically conditioned allomorphs occurring before verb bases which begin with -ř- and -n-. For simplicity these are not listed.

[5] Some Spanish roots are borrowed directly: -kosina *cook*, but the majority occur with -mo- prefix. -mo- is the morpheme which usually signifies CAUSATIVE, occurring as an inflectional prefix. When occurring as a derivational prefix with a Spanish root it does not have causative meaning.

[6] Types (5) (6) and (7) occur rarely. Types (6) (7) and the stems which include the habitual tense suffix do not occur with inflectional affixes.

[7] This is the unique example of derivation type (8). The morpheme -mae- usually occurs as an inflectional prefix with meaning *non-human object generalizer.* As such it occurs with a transitive verb base resulting in an intransitive. In type (8) it occurs with an intransitive verb base resulting in an intransitive.

prefixes with which they occur. Intransitive roots and stems of subclass 1 (IS1) occur with person prefix sets Ia and Ib: og^{w}ata (o- + -g^{w}ata) *he walked.* Intransitive roots and stems of subclass 2 (IS2) occur with person prefix sets IIa and IIb: oikoβe (oi- + -koβe) *he awoke.* Intransitive roots and stems of subclass 3 (IS3) occur with person prefix sets IIIa and IIIb: ipiřu (i- + -piřu) *he is thin.*

Transitive verbs may be further cross-classified according to whether or not they can occur with a human object. -aïu *love* occurs with a human object; -putuka *wash* (clothes) does not. Verb bases occurring in the head slot of human object transitive verbs may occur with person prefix sets A and B.

Both transitive and intransitive roots and stems may occur as nuclei of transitive and intransitive verbs. Both prefixes and suffixes may occur with the roots and stems (with exceptions noted in footnote 6), resulting in transitive and intransitive verb bases. The verb bases together with the obligatory person prefix result in transitive and intransitive verbs.

Lists 1 and 2 show the inflectional affix systems of transitive and intransitive verbs. The past tense marker occurs as unique member of suffix order II in each of the formulas.

List 1. Transitive Verb: 1. +P pre(a) ±(+PrII: Caus1 +PrI: Mod) +Stem: TS1, SuI: Caus2, SuII: Past; 2. +P pre (b)/[+P pre(a) +(+PrII: Caus1 +PrI: Mod)] +Stem: TS2, SuI: Caus2, SuII: Past; 3. +P pre(a) +PrI: Caus1/Com +Stem:IS, SuI: Caus2, SuII: Past.

List 2. Intransitive Verb: 1. +P pre(a1) ±*(+PrII: Mod + PrI: Caus1) +Stem: IS1, SuI: Caus2*, SuII: Past; 2. +P pre(b1)/[+P pre(a1)+(+PrII: Mod +PrI: Caus1)]* +Stem: IS2, SuI: Caus2*, SuII: Past; 3. +P pre(c)/[+P pre(a1) +(+PrII: Mod + PrI: Caus1)]* +Stem: IS3, SuI: Caus2*, SuII: Past; 4. +P pre(a1) +Mod +TS, SuI: Caus2, SuII: Past.

Explanation of lists: + signifies obligatory occurrence; ± signifies optional occurrence; , signifies order of occurrence. The formulas are a mixture of occurrence and order types. As far as, and including, the stem slot they are occurrence formulas; after the stem slot (suffix sections of the formulas) they are order formulas. This is because all orders of prefixes occur with the stem, but not all orders of prefixes and suffixes. Both orders of suffix occur optionally.

TS = transitive root or stem; IS = intransitive root or stem; P pre = person prefix; Caus1 = causative prefix; Mod = modal prefix; Com = comitative prefix; Caus2 = causative suffix; Past = past tense suffix; / signifies either/or; the asterisks after Caus2 and the + of ± in formula 1 of list 2 indicates that Caus2 occurs only if the contents of the parenthesis occur. Similarly in formulas 2 and 3 of list 2, Caus2 occurs only if the second alternative of the either/or occurs.

Formulas 1 and 2 of list 1 show transitive stems as nuclei of transitive verb base. Transitive verb base may consist of either transitive stem or transitive stem with two prefixes, Causative 1 and Modal (together with possible occurrence of Causative 2). With stem class TS1 member as nucleus, the person prefix occurring with the base is P pre(a). With stem class TS2 member as nucleus, when Causative 1 and Modal occur, P pre(a) occurs; when Causative 1 and Modal do not occur, P pre(b) occurs.

Formula 3 of list 1 shows intransitive stem as nucleus of transitive verb base. Transitive verb base consists of intransitive stem with obligatory prefix Causative 1 or Comitative (together with possible occurrence of Causative 2 and occurs with person prefix P pre(a)).

Formulas 1, 2 and 3 of list 2 show intransitive stems as nuclei of intransitive verb base. Intransitive verb base may consist of either intransitive stem or intransitive stem with two prefixes, Modal and Causative 1

(together with optional suffixes, Causative 2 and Past). With stem class IS1 member as nucleus, the person prefix occurring with the base is P pre(a1). With stem class IS2 member as nucleus, when Modal and Causative 1 occur, P pre(a1) occurs; when Modal and Causative 1 do not occur, P pre(b1) occurs. With stem class IS3 member as nucleus, when Modal and Causative 1 occur, P pre(a1) occurs; when Modal and Causative 1 do not occur, P pre(c) occurs.

Formula 4 of list 2 shows transitive stem as nucleus of intransitive verb base. Intransitive verb base consists of transitive stem with obligatory prefix Modal (together with possible occurrence of Causative 2), and occurs with person prefix P pre(a1).

Person prefixes P pre(a) include person prefix sets Ia, Ib, A, B (A and B restricted to human object verbs). Person prefixes P pre(b) include person prefix sets IIa, IIb, A, B. Person prefixes P pre(a1) include person prefix sets Ia, Ib. Person prefixes P pre(b1) include person prefix sets IIa, IIb. Person prefixes P pre(c) include person prefix sets IIIa, IIIb. All sets containing a/A have INDICATIVE meaning; all sets containing b/B have SUBJUNCTIVE meaning.

In the following lists of person prefix sets, the meanings of the prefixes when they occur with transitive verb base are listed preceding diagonal (/) (subject meaning precedes hyphen (-), object meaning follows hyphen); when they occur with intransitive verb base they are listed following diagonal. Prefix sets IIIa and IIIb occur only with intransitive verb base of type 3 and therefore have only subject meanings. Prefix sets A and B occur only with transitive verb base and therefore have only subject-object meanings. 1, 2, 3 = first, second, third person; s = singular; p = plural; i = inclusive; e = exclusive.

Person prefix set Ia includes: a- *1s-3/1s*, ře- *2s-3/2s*, ña- *1pi-3/1pi*, řo- *1pe-3/1pe*, pe- *2p-3/2p*, o- *3-3/3*.

Person prefix set Ib[8] includes: ta- *1s-3/1s*, e- *2s-3/2s*, ña- *1pi-3/1pi*, tořo, *1pe-3/1pe*, pe- *2p-3/2p*, to- *3-3/3*.

Person prefix sets IIa and IIb are the same forms as sets Ia and Ib with the addition of -i-: ai- *1s-3/1s*, řei- 2*s*-3/2*s*, etc. It does not seem possible to assign any meaning to the -i-.

Person prefix set IIIa[9] includes: če- *1s*, ne- *2s*, ñąne- *1pi*, oře- *1pe*, pe- *2p*, i- *3*.

Person prefix set IIIb includes: tače- *1s*, ne- *2s*, ñąne- *1pi*, oře- *1pe*, pe- *2p*, ti- *3*.

Person prefix set A includes: če- *2,3-1s*, řo- *1-2s*, ne- *3-2s*, ñąne- *3-1pi*, oře- *2,3-1pe*, pe- *3-2p*.

Person prefix set B includes: če- *2-1s*, tače- *3-1s*, tořo- *1-2s*, tane- *3-2s*, tįñąne- *3-1pi*, oře- *2-1pe*, toře- *3-1 pe*, topo- *1-2p*, tape- *3-2p*.

The inflectional prefixes and suffixes which occur with the root or stem are now discussed.

Within the verb base each added order of prefix causes a change from transitive to intransitive or from intransitive to transitive. Thus transitive verb bases result from either transitive stem + two prefixes or intransitive stem + one prefix. Intransitive verb bases result from either intransitive stem + two prefixes or transitive stem + one prefix. Person prefix and suffixes do not cause a change in transitivity. -kařu *eat*, okařu (P pre + -kařu) *he ate* (intransitive), ǫmǫŋařu (P pre +Caus1 + -ŋařu) *he fed him* (transitive), ǫñęmǫŋařu (P pre +Mod

[8] In the majority of the subjunctive person prefixes there occurs an apparent t-/tV- (the allo-forms being phonologically conditioned) addition to the indicative person prefixes. It does not, however, seem possible to assign to this phenomenon morphemic status, i.e. morpheme meaning SUBJUNCTIVE, since in some cases there is no difference between subjunctive and indicative prefixes, and in the case of the subjunctive second singular person (e-) SUBJUNCTIVE would be marked by a subtractive morpheme.

[9] The members of person prefix sets IIIa and IIIb have morphologically conditioned allomorphs, but not being pertinent to this paper their description has been omitted.

+Caus1 + -ŋařu) *he fed himself* (intransitive); -mo?e *teach*, ǫmo?e (P pre + -mo?e) *he taught him* (transitive), ǫñęmo?e (P pre +Mod + -mo?e) *he learned* (intransitive), ǫmǫñęmo?e (P pre +Caus1 +Mod + -mo?e) *he caused him to learn* (transitive).

Lists 1 and 2 show that prefix order I (PrI) occurring with transitive stems is the same as prefix order II occurring with intransitive stems, and vice versa.

Prefix order I occurring with transitive stem or base resulting in an intransitive verb base as in list 2, formula 4, contains four members:

-ñe- *passive/reflexive*: oñeñuka (o-ñe-ñuka) *he killed himself*; oñeputuka (o-ñe-putuka) *it is washed*; oñeñukauka (o-ñe-ñuka-uka) *he was killed (by him)*.

-ño- *reciprocate*: oñoñuka (o-ño-ñuka) *they killed one another*.

-pořo- *human object generalizer*: opořoñuka (o-pořo-ñuka) *he kills* (humans), *he is a killer*.

-mae- *non-human object generalizer*: ǫmae-ñuka (o-mae-ñuka) *he kills* (non-humans), *he is a butcher or hunter*.

Prefix order I occurring with intransitive stem resulting in a transitive verb base as in list 1, formula 3, contains two members:

-mo- *causative*: ǫmogʷata (o-mo-gʷata) *he caused him to walk*.

-řo- *comitative*: gʷiřósïi (gʷi-řo-sïi) *he ran along with him*.

Examples showing occurrence of inflectional prefixes in other formulas of lists 1 and 2 follow. List 1, formula 1: ǫmǫmaeputuka (o-mo-mae-putuka) *she caused her to wash clothes*. List 1, formula 2: ǫmǫñęnųpą (o-mo-ñe-nųpą) *he caused him to hit himself*. List 2, formula 1: ǫñęmoñao (o-ñe-mo-ñao) *they are separated*. List 2, formula 2: ǫñęmǫiŋoβe (o-ñe-moi-ŋoβe) *he wakened himself up*. List 2, formula 3: ǫñęmǫąkĩ (o-ñe-mo-ąkĩ) *he wet himself*.

Suffix order I contains one member: -uka *causative*: oñukauka (o-ñuka-uka) *he caused (him) to kill him*; ǫmoñoñukauka (o-mo-ño-ñuka-uka) *he caused them to kill one another*.

Suffix order II contains one member: -se *past tense*: ogʷatase (o-gʷata-se) *he used to walk*.

Caus1 vs. Caus2: The essential difference between the causative prefix and the causative suffix is that the prefix occurs with intransitive stem, the resulting verb base being transitive; the suffix occurs with transitive stem, the resulting verb base remaining transitive. ogʷata (o-gʷata) *he walked*, ǫmogʷata (o-mo-gʷata) *he caused him to walk* (*him* is object); oñuka (o-ñuka) *he killed him*, oñukauka (o-ñuka-uka) *he caused (him) to kill him* (the final *him* is object).

-se *habitual tense* vs.-se *past tense*: That these differ structurally, occurring at different levels of analysis within the verb, may be seen by considering the immediate constituent analysis of the two verbs igʷatase *he habitually walks* (*he is a walker*), and ogʷatase *he used to walk*. ogʷatase = ogʷata *he walks* + optional -se *past tense*, ogʷata = o- *he* + -gʷata *walk*; igʷatase = i- *he* + -gʷatase *habitually walk*, gʷatase = gʷata *walk* + -se *habitual tense*. (*igʷata does not occur).

2. The verb phrase consists of nucleus + satellites. The nucleus slot is filled by the verb. Satellite slots are filled by: (1) Preperipherals, which are free words; (2) Peripherals I, which are free words; (3) Enclitics which are phonologically joined to the words which they follow; (4) Peripherals II, which are free words.

The future tense marker is an enclitic.

The habitual, past, and future tense markers may be illustrated by their occurrence with the verb root -pąřąnu *ask questions*: ipąřąnuse *he habitually asks questions*, ǫpąřąnuse *he used to ask questions*, ǫpąřąnuta *he will ask questions*.

The pre-peripherals always precede the verb, and include three members, each of which expresses some measure of negativity: maeti/agʷiñe/ŋařaa *negative*, añete *almost*, gʷɾ̃ąmǫi *perhaps*. Maeti is the non-future

negative; agʷíñe the imperative negative; ŋařaa the future negative. maeti aha *I did not go*, agʷíñe ecua *do not go*, ŋařaa ahi *I will not go*; añete oʔa *he almost fell*; gʷířąmǫi ahata *perhaps I will go*.

There are five orders of peripherals I (listed in usual order of occurrence): 1, Intensifier; 2, Mode; 3, Plural; 4, Iterative; 5, Frustrative.

Peripherals I order 1 contains several members all with similar meaning: ñae, ete, katu, asï, gʷasu *very* or *much*. The particular member of the intensifier class which occurs depends on the verb with which it occurs, the choice apparently being arbitrary. For extra intensity, however, two or three of the intensifier morphemes may occur together. oipota ñae *he wanted it much*, okï ete *it rained heavily*, ñĩmïaï ñae ete katu *he was very very very hungry*.

Peripherals I order 2 contains several members: gʷířae *quickly*, βoi *immediately*, seři *almost*, řaiβi *suddenly* βïari *secretly*. oasa gʷířae *he passed by quickly*, oho βoi *he went immediately*, okï seři *it almost rained*.

Peripherals I order 3 contains a single member řeta *plural*. ogʷata řeta *they walked*.

Peripherals I order 4 contains a single member ñe *again*. oho ñe *he went again*.

Peripherals I order 5 contains a single member tęį *in vain*. oho tęį *he went in vain* (that is, he did not accomplish that for which he went).

Examples of combinations[10] of peripherals I are: 1 + 2, oñaeʔo ñao βoi *she cried a lot immediately*; 1 + 3, ǫįnuṗą ñae řeta *they hit him a lot*; 1 + 5, oipota ñae tęį *she wanted it a lot in vain*; 2 + 3, oʔa seři řeta *they almost fell*; 2 + 4, okï řaiβi ñe *it rained again suddenly*.

There are five orders of enclitics (listed in usual order of occurrence):[11] I, Exclusivizer; II, Limiter; III, Future; IV, Determinative; V, Negative.

Enclitic order I contains a single member -i- *exclusivizer*. This occurs only if enclitic order II occurs, though order II can occur without order I. ogʷata-iñǫ (o-gʷata -i- -ñǫ) *he just walks* (that is, he does not work, go anywhere, nor visit, etc.)

Enclitic order II contains a single member -ñǫ *limiter*. ogʷata-ñǫ (o-gʷata -ñǫ) *he just walks* (that is, he may have been sick and cannot yet run, nor jump, etc.)

Enclitic order III contains a single member -ta *future*. oho-ta (o-ho -ta) *he will go*.

Enclitic order IV contains a single member -i *determinative*. oipota-i (oi-pota -i) *it definitely wanted to*.

Enclitic order V contains two forms of the *negative* enclitic -ʔą, n- --i. The second form is a morpheme the two parts of which are discontinuous; the n- is preposed to the verb and the --i is enclitic. oipota-ʔą (oi-pota -ʔą)/noipóta-i (n-oi-pota --i) *he did not want to*.[12]

Examples of combinations of enclitics are: II + III, aha-ñǫ-ta (a-ha -ñǫ -ta) *I will just go*; II + IV, ogʷata-ñǫ-į (o-gʷata -ñǫ -i) *he purposely walks* (that is, it is his job to walk), or *he walks notwithstanding* (that is, even though something may tend to prevent him) (Cf. ogʷata-iñǫ above); III + IV, oho-ta-i (o-ho -ta -i) *he will go notwithstanding*; III + V, nořohó-ta-i (no-řo-ho -ta --i) *we will not go*; I + II + III, ogʷapï-iñǫ-ta (o-gʷapï -i- -ñǫ -ta) *he will just sit*; II + III + IV, agʷata-ñǫ-ta-i (a-gʷata -ñǫ -ta -i) *I will walk notwithstanding*; II + IV + III, okï-

[10] Many combinations of peripherals and enclitics occur, the only apparent restrictions being semantics and length. The maximum number which have been found to occur together within a verb phrase in texts of stories and general conversation is four. The orders were determined by the criteria of relative order of occurrence, mutual exclusivity, and semantic similarity.

[11] Shift of stress shows these to be enclitic. óho, ohó-ta; ogʷáta, ogʷatá-iñǫ, ogʷatá-ñǫ; oipóta, oipotá-i. The negative n- --i does not cause shift of stress but --i always unites with the preceding vowel resulting in a diphthong.

Enclitics usually follow peripherals I and precede peripherals II.

[12] Non-future negative, therefore, may be manifested in one of three ways: (1) Enclitic -ʔą (2) Discontinuous enclitic n- --i (3) pre-peripheral maeti.

ñǫ-į-ta (o-kï -ñǫ -i -ta) *it will definitely (or continuously) rain*; II + III + IV + V, oipořaŕa-ñǫ-ta-i-ʔą (oi-pořaŕa -ñǫ -ta -i -ʔą) (pa) *should he not definitely just have suffered*

There are five orders of peripherals II (listed in usual order of occurrence): A, Temporal; B, Additive; C, Attitude; O, Probability; E, Manner.

Peripherals II order A contains three members: mą *already*, řąnį *first*, řąmǫ *recently*. oho mą *he went already*, akařu řąnį *I ate first* (that is, before doing something else), añu řąmǫ *I came recently*.

Peripherals II order B contains a single member *βi also*. ohi *βi he went also*.

Peripherals II order C contains three members: ko *definitely*, nipo *perhaps*, ñepe *even*. oha-ta ko *he will definitely go*, oho-ta nipo *he will perhaps go*, ǫįnųpą ñepe *he hit her even*.

Peripherals II order D contains a single member aipo *probably*. This usually occurs in combination with one of the members of peripherals II order C, ko or nipo. oho nipo aipo *he perhaps probably went*.

Peripherals II order E contains several members: heta *much*, tątą *hard*, tuiča *largely*. ǫįnųpą heta *he hit her much*, ogʷapï tątą *she sat hard* (on the horse), okï-ta tuiča *it will rain in a big way*.

Examples of combinations of peripherals II are: A + B, oho mą *βi he also has already gone*; A + C, okaru řąnį nipo *perhaps he ate first*; A + E, ǫįnųpą mą heta *he has already hit her a lot*; C + D, oho nipo aipo *he perhaps probably went*; A + C + D, oho mą ko aipo *he has already definitely probably gone*; A + C + D + E, ǫįnųpą mą ko aipo heta *he has already definitely probably beaten her a lot*.

Examples of combinations of peripherals I and peripherals II are: 1 + A, čęñį̈mïaï ñae mą *I am already very hungry*; 2 + A, okï seři mą *it already almost rained*; 3 + A, ñį̈mïaï řeta mą *they are already hungry*; 4 + A, ou ñe mą *he already returned*; 2 + A + C, ipu seři mą ko (ǫį kampana) (the bell is) *definitely already almost ringing*; 3 + 4 + A, okařu řeta ñe mą *they are already eating again*; 2 + A + C + D, oñï seři mą co aipo *it is definitely probably almost already cooked*; 4 + A + C + D, ou ñe mą co apio *he has definitely probably already returned*.

Examples of combinations of peripherals I and enclitics are: 1 + III, oñaeʔo ñae-ta *she will cry a lot*; 2 + III, aha *βi*aři-ta *I will go secretly*; 3 + III, oñapo řeta-ta *they will do it*; 4 + III, ou ñe-ta *he will return*; 2 + II, oñapo *βi*aři-ñǫ *he just did it secretly*; III + 5, oho-ta tęį *he would have gone* (contrary-to-fact sentence); 5 + III oho tęį-ta *he will go in vain* (that is, he will not accomplish his purpose).

Examples of combinations of enclitics and peripherals II are: III + A, aha-ta mą *I will just now go;* III + B, aha-ta *βi I will go also*; III + C, aha-ta ko *I will definitely go*; III + E, ǫįnųpą-ta heta *he will hit her a lot*; V + E/E + V, nogʷápï-i tątą/nogʷapï tątą-į *she did not sit hard* (on the horse).

Peripherals II often occur preceding the verb, in which case some other word often occurs between the peripheral(s) and the verb, thus making the verb phrase discontinuous. heta nañe okařu (E + reportative + verb) *much, it is said, he ate*. Discontinuity of the verb phrase, when the verb occurs first, is possible, but not usual. The only case observed is when both *plural* (3) and referent word (equivalent to indirect object) occur. osapúkai čupe řeta (verb + referent + 3) *they called to him*.

Pre-peripherals precede peripherals which occur before the verb. maeti heta ou (negative + E + verb) *not many came*.

When more than one order of peripherals II precede the verb, they do so in reverse order (with the exception of ko aipo). aipo nipo hoʔu (ǫį) (D + C + verb) *probably perhaps he (is) eating it*, heta mą ǫįnųpą (E + A + verb) *much already he hit her*.

When peripherals II precede the verb, peripherals I still follow the verb except *iterative* (4) which may precede the verb if *future* (III) occurs. Enclitics occurring with the peripherals may either precede the verb

or follow it. heta ñe-ta ǫ̨inųpą řeta (E + 4 + III + verb + 3) *they will hit him a lot again*, heta-ta řę̨inųpą ñe/heta řę̨inųpą ñe-ta (E + III + verb + 4)/(E + verb + 4 + III) *you will hit him a lot again.*

Discontinuity of the verb phrase occurs when some other word occurs between the pre-peripheral and the verb. maeti tata ąβąę (negative + object + verb) *I did not find fire.*

3. A complex verb phrase is defined as one that has a complex verb nucleus. The complex verb nucleus consists of one principal and one or more auxiliary verbs or two or more principal verbs with or without auxiliary verbs. The auxiliary verbs usually occur preceding the principal verb(s) and express ability, desire, movement, etc. Together with the principal verb(s) they form a hypotactic construction. ipueře oñapo (Aux. + Prin.) *he can do it*, oipota oñapo (Aux. + Prin.) *he wants to do it*, oho oeka (Aux. + Prin.) *he goes to seek it.* The two or more principal verbs form a paratactic construction. mǫmïrï gʷïřaha ǫ̃ǫ̃tï oeña (E + Prin. + Prin. + Prin.) *far he carried it he planted it he left it.*

The only auxiliary verb which follows the final principal verb is the verb -į which marks the continuative tense. ogʷata ǫ̨į (Prin. + Aux.) *he is walking.*

Note now the contrast in the way of marking each of the four tenses: -kaʔu *drink* (intoxicants) (intransitive), habitual—ikaʔuse *he habitually drinks*, past—okaʔuse *he used to drink*, future—okaʔu-ta *he will drink*, continuative—okaʔu ǫ̨į *he is drinking.*

Of the four tense markers only future and continuative may occur together. okaʔu-ta ǫ̨į *he will be drinking.*

Auxiliary verbs may occur as heads of verb phrases,[13] in which case they act as principal verbs. oipota oho (Aux. + Aux.-Prin.) *he wanted to go*, oipota (Aux.-Prin.) *he wanted it.*

Other words often occur within the complex verb phrase, thus making it discontinuous. The discontinuity usually occurs between auxiliary and principal verbs, between principal verbs (when not preceded by auxiliary verbs), and between principal and following auxiliary verbs. opa mi̧čią̨ę řeta ǫmǫmo oeña (Aux. + object + Prin. + Prin.) *he completely threw out left the children* (mi̧čią̨ę řeta = *children*), oho heinï gʷeřu (Aux. + object + Prin.) *he went to bring his sister*, gʷïřaha ñąną řupi ǫmotąβï (Prin. + locational phrase + Prin.) *he took them deceived them in the woods*, čęñ̃mïaï ñae mą kuae ïβïkua pe ą̨į (Prin. + 1 + A + locational phrase + Aux.) *I am already very hungry in this cave.*

When enclitics occur in a complex verb phrase, they are attached to the first verb in the series, or to maeti *negative* or peripherals II order E if either occurs first. When peripherals occur they usually follow either the first verb or the final principal verb. (When hekuae *it continues* occurs as first verb it is followed immediately only by the enclitic II -ñǫ. hekuae-ñǫ oho *he just continued going.* The other enclitics and the peripherals follow the next verb.) When both enclitics and peripherals occur, they do so in the order described in **2**. aha-ta ąmąę (Aux. + III + Prin.) *I will go look*, hekuae oho ñe Pedro oeka tata (Aux. + Aux. + 4 + subject + Prin. + object) *Peter continued to go again to seek fire*, aha ñe-ta pea kotï ąmąę (Aux. + 4 + III + locational phrase + Prin.) *I will go again in that direction to look.*

[13] Except for one impersonal auxiliary verb hekuae *it continues.*

ABSTRACTS AND TRANSLATIONS

1. Publications on Paleo-Siberian languages abstracted by Dean Stoddard Worth:

K voprosu o sravnitel'nom izučenii čukotsko-kamčatskix jazykov ("On the Comparative Study of the Chukchee-Kamchatkan Languages"). By P. Ja. Skorik. Akademija Nauk SSSR, Otdelenie Literatury i Jazyka, Izvestija, vol. 27, no. 6 (1958), pp. 534–546.

Recently collected materials make possible a number of revised statements concerning the origin and development of the NE Paleosiberian languages (Chukchee, Koryak, Kerek, Aljutor, Kamchadal; cf. Skorik's article K voprosu o klassifikacii cukotsko-kamcatskix jazykov abstracted below). Ch(ukchee), Ko(ryak), Ke(rek) and Al(jutor) are much more closely related to each other than are they as a group to Kam(chadal), which has a voiced-voiceless opposition, a palatalized-non-palatalized opposition, fortis vs. lenis stops in addition to voiced-voiceless pairs, free clustering of consonants (Ch, Ko, Ke, Al permit a maximum of two consonants together), no incorporation, non-expression of person in nouns and adjectives, etc.

Earlier works permitted certain statements concerning historical phonology, e.g. that the present strong vs. weak glottal stops of Ch developed from an earlier opposition of uvular /q/ vs. pharyngeal /h/. It can now be established that the present degrees and types of synharmonism (regular in Ch, almost regular in Ko, sporadic in Kam, vestigial in Al, entirely absent from Ke) arose from an original double-step synharmonism of which the Kam alternations /i/ ∽ /e/ ∽ /a/ and /u/ ∽ /a/ ∽ /o/ are traces. In morphology, one can now assume that the three motion cases of Ko (ablative, dative, and 'down-along' [Russian *prodol'nyj*]) and two of Ch (ablative, dative) developed from a single relative case. The Ko verb pre- and suffixes ku/k- . . . -n can be identified with the Kam participles in k'- . . . -in/en/an. Transitive and intransitive verbs were probably not distinguished in proto-Chukchee-Kamchadal; originally, there was simply a suffix indicating 'substantive involved in verbal action', which later split into the present actor-goal dichotomy.

Many linguistic facts of this group can be explained by substrata. Ch and Ko took over territories from Shelagi, Anauly, Chuvancy, as well as from the Yukaghir and the Eskimo. Al and Ke are particularly influenced by Eskimo (loss of synharmonism, no /e/ or /o/ in Ke, etc.). Al probably arose from Ch and Ke from Ko, but cross-influence of Ch on Ke and of Ko on Al compounded the influence of Esk on both to produce the present complicated situation. Kam separated very early from the general stock, and also underwent much stronger external influence than Ch, Ko, Ke, and Al. This influence, manifested in the different auxiliary verbs, different suffixes for 4/6 of cases, etc., is of unknown origin.

K voprosu o klassifikacii cukotski-kamcatskix jazykov ("Towards a Classification of the Chukchee-Kamchatkan Languages"). By P. Ja. Skorik. Voprosy Jazykoznanija (1958), no. 1, pp. 21–35.

This article proposes a revision in the traditional classification of the northeastern group of Paleosiberian languages, which include the languages usually called Chuckchee, Koryak, and Kamchadal (Russ. Itel'men). The group name "Chukchee-Kamchatkan," based on the area inhabited by this group (the Chukchee and Kamchatka peninsulae) is suggested as a replacement for the cumbersome or inaccurate genetically-oriented terms used in the past.

All languages of this group share many common traits in their phonemic systems (the post-velar consonants, absence of

the palatalized::non-palatalized opposition, etc.). Kamchadal has the most elaborate phonemic system, Kerek (formally considered a Chukchee dialect, but treated here as a separate language) the simplest. All languages but Kerek are synharmonic. There are many regular sound correspondences among these languages, e.g. Ch(ukchee) /r/ ∽ Ko(ryak) /j/, /r/, or /t/ ∽ Kam(chadal) /ž/ ∽ Ke(rek) /r/ or /n/. In morphology, all show pre- and suffixal agglutination, in all but Kam nouns express person, adjectives are declined not in case but only in person and number. Ch, Kam, and some Ko dialects express singular and plural, whereas Ke and other Ko dialects have the dual as well. Nominal suffixes are closely related in Ch, Ke, and Ko, as are derivative procedures; in both respects Kam stands somewhat apart, although the Kam verb morphology is quite like that of the other languages. All but Kam show extensive incorporation, and all without exception have both nominative and ergative structures. Lexical differences are greater than grammatical, although there are marked similarities among pronouns and some kinship and body-part terms. Kam is opposed to Ch, Ko, and Ke by most of its lexicon; Ke coincides partly with Ch, partly with Ko, as in morphology. The general conclusion is that all (Ch, Ke, Ko, Kam) are genetically related, but that Kam is opposed to the other three taken together by many important features.

The second half of the article deals with Koryak dialectology. Of the eight traditional Koryak dialects, two are of major importance (Čavčuvenskij and Aljutorskij). The differences between these two are treated in some detail, and it is proposed to elevate Aljutor to the status of a separate language, which would include the Karaga and Palan dialects.

The final classification of northeast Paleosiberian—which may need some refinement—is then: Chukchee, with dialects Uellenskij, Pevekskij, Enmylinskij, Nunligranskij and Xatyrskij; Kerek, with Majnapil'ginskij and Xatyrskij dialects; Koryak, with dialects Cavcuvenskij, Apukinskij, Kamenskij, Parenskij and Itkanskij; Aljutor, with Aljutorskij, Karaginskij and Palanskij dialects; Kamchadal (Itel'men) with Sedanskij, Xajrjuzovskij, Napanskij and Sopocnovskij dialects.

Rodovj i plemennoj sostav naradov Sibiri v XVII veke (The Tribal Structure of Siberian Peoples in the XVIIth Century). By B. O. Dolgix. Akakemija Nauk SSSR, Institut Ètnografii, Trudy, new ser., LV. Moscow, 1960.

Pp. 549–578 of this basic work concern the population of the Northeast and Kamchatka, i.e., the Chukchee, Koryak, and Kamchadal among others. The orientation is of course basically ethnographic, but a certain amount of linguistic information is offered as well. The bulk of the latter is taken from easily available sources, however (e.g., Krašeninnikov's Opisania zemli Kamčatki in the 1949 ed.), and will serve more to enlighten the ethnographer than to inform the linguist. The principal merit of the work is to be sought in its detailed statistics concerning population change; nothing of similar thoroughness has yet come to my attention. Dolgix also underlines the partially self-contradictory character of some of Krašeninnikov's XVIIIth c. reports on the tribal adherence of the Kamchatka population (e.g. were the Western Kamchadals really Koryaks? the southern Kamchadals really Ainu?), which is important since later scholars have tended to accept K's accounts at face value.

Čukotsko-russkij slovar' (Chukchee-Russian Dictionary). By T. A. Moll and P. I. Inènlikèj. Ed. by P.Ja. Skornik. Leningrad, 1957.

This dictionary of approximately 8000 words arranged in strict alphabetical order is designed for use in the Chukchee schools rather than as a scholarly tool, but is none-

theless a most valuable addition to the meager lexical resources available in Paleosiberian. It is presumably reworked from the earlier dictionaries of Bogaraz and Skorik, but (as Tailleur (Lingua 9: 3.296.7 (1960)) pointed out) deviates considerably from its models. The dictionary contains a number of dialect words in addition to those from the literary language, and is also seeded with Russian borrowings, which may or may not be in actual use. The dictionary proper is followed by a phonemic and grammatical sketch of Chukchee, and by a list of verbal stems which alternate morphophonemically in an- and inlaut position. One regrets only that the dictionary was not provided with a logical index or at least a cross-reference list in Russian, which would have simplified the task of searching out Chukchee equivalents for items in, say, Eskimo.

Russian Borrowings in Kamchadal. By D. S. Worth. Orbis, vol. IX, no. 1 (1960), pp. 83–109.

Some 260 Russian loanwords of the XVIIIth–XXth centuries are listed and classified, including the degree of phonemic and morphologic incorporation into Kamchadal. Borrowings include not only substantives, but a number of pronouns, adverbs, interjections, and particles.

Mladopis'mennye jazyki narodov SSSR (The Newly Literary Languages of the Peoples of the USSR). Ed. by E. A. Bokarev and Ju. D. Dešeriev. Moscow-Leningrad, 1959.

This collectively authored volume presents a survey of Turkic, Caucasian, Finno-Ugric, Iranian, and Mongol languages of the U.S.S.R., as well as a section of the language of the "Peoples of the North," which include the speakers of Eskimo and Aleut, Tungus-Manchu, and the Chukchee-Koryak-Kamchadal group. The latter is described by P. Ja. Skorik, pp. 352–379. Skorik gives an outline survey of the study of these languages both before and after the October Revolution. This survey is followed by a brief description of the major common features and differences observable in this group. Since these features and differences have been described in more detail by the same author in the Voprosy jazykoznanija and Izvestija articles abstracted above, they need not be discussed here.

Paleosiberian Peoples and Languages. A Bibliographical Guide. By Roman Jakobson, Gerta Hütl-Worth, and John Fred Beebe. New Haven, 1957.

This indispensable guide to anyone working in the Paleosiberian field has already been adequately reviewed (by P. Ja. Skorik in Voprosy jazykoznanija 1958/2, R. Austerlitz in Word XV/2 1959, J. Angere, K. Menges in Ural-altaische Jahrbücher XXXII/1–2 [1960]), and so needs only brief mention here. It assembles for the first time approximately 200 references on the Paleosiberian peoples and their languages, divided into a survey of bibliographies (app. 75 items), general works (600), Gilyak (250), the Chukchee-Koryak-Kamchadel complex (800), Yukaghir (100), and Yeniseian (150). The bibliography proper is followed by a five-page survey of Paleosiberian peoples and languages by Roman Jakobson.

Plaidoyer pour le youkaghir, branche orientale de la famille ouralienne ("A Plea for Yukaghir as an Eastern Branch of the Uralic Family"). By Olivier Guy Tailleur. Lingua, vol. 8, no. 4 (1959), pp. 403–423.

In spite of the scepticism shown by many linguists in recent years, the Yukaghir language (spoken by some 350 people in two dialect areas in the eastern part of north central Siberia) must be considered a branch of the Uralic family. Tailleur recapitulates the morphologic and lexical comparisons of his predecessors (Lewy, Bouda, Collinder etc.) and adds 12 nominal and 18 verbal suffixal equations. The author also furnishes well over 100 new lexical comparisons, drawn from the stock of over 500 equations

accumulated during several years' research. The great number of demonstrable lexical correspondences, taken together with the fact that the entire morphologic apparatus of Yukaghir coincides with that of various Uralic languages, serves as definite proof that Yukaghir is genetically related to the Uralic stem. The author closes his detailed analysis with the hope that the remaining sceptics will soon revise their attitude.

Zu einem Wörterbuch der jukagirischen Sprache. ("On a Yukaghir Dictionary") By Olivier G. Tailleur. Zeitschrift der deutschen Morgenländischen Gesellschaft, vol. 110, no. 1 (1960), pp. 83–98.

Tailleur discusses in detail the Jukagirisch-deutsches Wörterbuch of Johannes Angere (Stockholm/Wiesbaden, 1957), pointing out a number of errors and omissions which detract from the scholarly value of the work, although it remains a useful aid to the scholar who wishes to read the Yukaghir texts published by Jochelson in Materialy po izučeniju jukagirskogo jazyka i fol'klora, SPb, 1900 et al. Angere's denial that Yukaghir belongs to the Uralic stem is contested by Tailleur, who is preparing a major comparative study on this problem, La parenté ouralienne de la langue youkaghire.

Les uniques données sur l'omok, langue éteinte de la famille youkaghire ("Unique data on Omok, An Extinct Language of the Yukaghir Family"). By Olivier Guy Tailleur. Orbis, VIII, 1, 1959, pp. 78–108.

A comparison of the Chuvants and Omok vocabularies collected some 125 years ago by Matjuškin with other Yukaghir family sources reveals that whereas Chuvants is closely related to southern Yukaghir (spoken on the upper Kolyma), Omok differs considerably from the latter. However, Omok is much closer to S Yukaghir than to the northern dialect (spoken on the lower Alazeja). Tailleur thus posits an original distribution in four dialect groups: Northern Yukaghir, Southern Yukaghir (including the extinct Northwest dialect), Chuvants, and Omok. However, the poor quality of Matjuškin's transcription casts doubt on the validity of certain comparisons.

Notes on Gilyak. By Roman Jakobson. Studies Presented to Yuen Ren Chao on his Sixty-fifth Birthday, pp. 255–281, Academia Sinica, Institute of History and Philosophy, Bulletin, XXIX. Taipai, Taiwan, 1957.

The Introduction contains a detailed survey of sources on the Gilyak from the XIIIth century onward and an outline of Grammatical Essentials based primarily on a structural reinterpretation of the materials in E. Krejnovič's Gilyak texts. There follows an outline of Phonemic Essentials based on the distinctive feature in Jakobson and Halle's Fundamentals of Language. Gilyak contains the phonemes /t, t′, r, r′, p, p′, v, f, ţ, ţ′, z, s, k, k′, γ, x, q, R, n, m, ŋ, ŋ, l, j, i, (w), u, ə, e, o, a, h, #/.

The second half of the article deals with Consonantal Interchange. Aspirated plosives alternate with voiceless constrictives in the fortes series, whereas the non-aspirated plosives alternate with the voiced constrictives in the lenes series. The various morphophonemic conditions for such alternations are described in some detail. Jakobson draws the diachronic conclusion that all initial obstruents were plosives and that initial plosives constrictives after morphemes ending in vowel or plosive. Gilyak in its earlier stages was thus much like modern Danish, distinguishing strong and weak word-positions, within which the same phonemic opposition is realized in different ways: Old Gilyak opposes strong /k′/ to weak /k/ as [k′]::[k] in strong position but as [k]::[x] in weak position.

A final footnote announces that further studies in Gilyak phonemics and morphology, as well as historical lexicology, will be forthcoming.

La place du Ghiliak parmi les langues paleosibériennes ("The Place of Gilyak

among the Paleosiberian Languages"). By Olivier Guy Tailleur. Lingua, vol. 9, no. 2, (1960), pp. 113–146.

This article consists of a preliminary report on the author's research in morphological and lexical comparison between Gilyak on the one hand and the Chukchee-Koryak-Kamchadal complex on the other. There appear to be but few morphological equations (6), but many convincing lexical correspondences (184 equations). All comparisons so far are based on Anlaut consonantism, and the author notes how much remains to be done in interior consonantism and vocalism. Tailleur accepts Bouda's Chukchee-Uralic hypothesis, and posits a (more distant) Gilyak-Uralic relation, for which 10 equations are furnished. The Chukchee (= N. E.) group is thus, according to Tailleur, divided into a northern branch containing the Chukchee-Koryak complex, Karaghinian, and Kamchadal, and a southern branch consisting of Gilyak.

Loan Words in Gilyak. By Moritaka Takahashi. Cho-sen Journal, vol. 14, (1959), offprint paginated 1–15.

Takahashi discusses a number of the equations in Krejnovič's Giljacko-tungusoman'čžurskie jazykovye paralleli (Linguistic parallels in Gilyak, Tungus, and Manchu") on the basis of his own and others' research in comparative vocabulary, providing (or suggesting) explanations of the origins of Gilyak words in the areas of cultural words, animals, metals, hunting and fishing, foods, spiritual life, social life, etc. He also notes some interesting parallels between Gilyak and Uralo-Altaic, but hesitates to classify Gilyak as a Uralo-Altaic language.

Imennye klassy i grammatičeskie sredstva ix vyraženija v ketskom jazyke ("Nominal Classes and the Grammatical Means of Expressing Them in Ket"). By E. A. Krejnovič. Voprosy Jazykoznanija, (1961), no. 2, pp. 106–116.

This article describes the various formal markers of gender in Ket. Gender is expressed not in nouns themselves, but in the various classes which combine with nouns: adjectives, verbs, and numerals. Gender of both subject and object can be expressed, in intransitive and transitive verbs. The categories of gender and number are mutually exclusive as in Russian; in both, gender is expressed only in the singular. There is also some evidence pointing to the existence of a category of whole, undivided organisms (entire fish, opposed to cut-up fish, etc.), of which masculine and feminine are sub-categories. The overwhelming majority of Ket words are neuter. Among the masculines are names of men and male animals, several series of fish, birds, insects and reptiles, some kinds of trees, and certain cosmic bodies. Feminines include names of women and female animals, other kinds of birds, fish, reptiles, cosmic bodies, and certain plants, geographical locations, parts of the body, skin diseases, and objects of material culture. The article, which includes several complete conjugations, was based on the author's personal observations on a field trip of almost three months' duration in autumn, 1959.

Un îlot basco-caucasien in Sibérie: Les langues iénisséiennes ("A Basque-Caucasian Islet in Siberia: The Jenissej Languages:). By Olivier Guy Tailleur. Orbis, vol. 8, no. 2, (1958), pp. 415–427.

After noting that Bouda's efforts to attach Ket to Sino-Tibetan are based purely on lexical equations and devoid of any morphological support, Tailleur offers several dozen morphological equations and pronominal etyma connecting Ket to Basque and the northern Caucasian languages. A number of common grammatical and phonetic procedures held in common by these languages are noted, as are some two dozen lexical equations. The article is presented as a preliminary study, recognizing that Basque-Caucasian unity itself is not universally accepted.

2. Japanese publications abstracted by Hauro Aoki:

Tibetto go to Biruma go ni okeru toneemu no taioo ni tuite ("On Tonemic Correspondence Between Tibetan and Burmese"). By Tatsuo Nishida. Gengo Kenkyu ("Journal of the Linguistic Society of Japan"), no. 34 (1958), pp. 90–95.

Both the Modern Central dialect of Tibetan and Modern Burmese (Rangoon dialect) have tonemic systems of 'register tones'. Historically the tonemic contrast in Modern Tibetan may be regarded as originating from a contrast in segmental phonemes. There are two tonemes in Modern Central Tibetan (CT): 53 high-falling, and 13 low-rising. (The Arabic numerals represent tonemes). The relationship to the initial consonant(s) of 9th century Tibetan (WT) is as follows:

WT	CT	WT	CT	WT	CT
k′- >	k′-1	#g- >	k′-2	#ŋ- >	ŋ-1
c′- >	c′-1	#j- >	c′-2	Cŋ- >	ŋ-2
Cg- >	g-2	s- >	s-1		
Cj- >	j-2	(C)z- >	s-2		

Modern Burmese has four tonemes: 22–23, 442, 41, and ʔ44. Tonemic correspondences between Burmese and Tibetan can be observed, and these correspondences make it possible to trace the Burmese tonemic contrast likewise back to segmental phonemic contrast. The correspondences are (N: nasal, K: velar stop, TB: Proto-Tibeto-Burman, B: Burmese):

	B	CT		TB
1.	N2	N1	<	*CN-
2.	N1	N2	<	*#N-
3.	K1	k1	<	*k-, *Ck-
4.	K2	g2	<	*Cg-
5.	k′2	k′1	<	*k′-, *Ck′-
6.	k′2	g2	<	*Cg′-
7.	k′1	k′2	<	*#g-
8.	CVʔ4	CVK1		
9.	CVʔ4	CVK2		

A Lexicostatistic Study on the Ainu Dialects. By Shirô Hattori and Mashiho Chiri. Minzokugaku-kenkyu ("The Japanese Journal of Ethnology"), vol. 24, no. 4 (1960), pp. 21–66.

1. The data on which the present paper is based were gathered in 1955 and 1956 by Hattori, Chiri and five other field workers (T. Mineya, S. Kimura, K. Yamamoto, S. Fukuda, H. Kitamura) engaged in the survey of 19 Ainu dialects which are on the verge of extinction.

2. The informants ranged from 53 to 86 in age, and from complete fluency to the limited ability to produce isolated glosses or short sentences in their command of the languages. In the case of three dialects (Sôya, Yakumo, Nayoro) the informants were the last speakers of the respective dialects, and two informants (for Yakumo and Bihoro) have died since the survey.

Of the 19 dialects surveyed, 13 are of Hokkaido (1. Yakumo, 2. Oshamambe, 3. Horobetsu, 4. Hiratori, 5. Nukkibetsu, 6. Niikappu, 7. Samani, 8. Obihiro, 9. Kushiro, 10. Bihoro, 11. Asahikawa, 12. Nayoro, 13. Sôya), and the remaining 6 are originally of Sakhalin (14. Ochiho, 15. Tarantomari, 16. Maoka, 17. Shiraura, 18. Raichishka (Rayciska), 19. Nairo) elicited from refugee speakers now residing in Hokkaido, where the field work was conducted.

3. The notation is phonemic. In some Hokkaido dialects there is phonemic pitch contrast, but not in Samani, Bihoro (and possibly in Kushiro). In Sakhalin dialects the pitch is not phonemic, but the vowel length is. Hattori thinks that Proto-Ainu had phonemically significant vowel length but not phonemically distinct pitch contrast.

4. Section 4 contains Swadesh's 200 list items for the 19 dialects.

5. Each entry is classed under one of the following seven possibilities: (1) cognates, i.e. residues, (2) non-cognates, (3) of the two entries elicited as response to one list item, one is a cognate while the other is a

non-cognate and no additional information as to the difference between the items was available, (4) doubtful cognates, (5) doubtful records, (6) lack of response (for unfamiliarity, unsatisfactory communication with the informant, loss of memory), (7) lacuna of record.

6. Section 6 deals with some problems in determining cognate relationships.

7. The percentages of the residual cognates are given.

8. On the basis of the preceding, the following points are noted: (1) There is a considerable gap between the Hokkaido and Sakhalin dialects. (2) The Sôya dialect is relatively removed from other Hokkaido dialects and demonstrates a closer affinity to Sakhalin dialects than any other Hokkaido dialect. Of the Hokkaido dialects, Nayoro, Asahikawa, Hiratori, Niikappu, and Horobetsu show a slightly greater percentage of cognates with the Sakhalin dialects. (3) Among the Hokkaido dialects there are possible subgroups within which there is relatively great affinity such as (a) Yakumo and Oshamambe, (b) Nukkibetsu, Hiratori, and Niikappu, (c) Obihiro, Kushiro, and Bihoro, while between subgroups there appear to be only relatively remote relationships. (4) There is a potentially significant discrepancy in the percentage of the common residue between Samani on the one hand and Niikappu, Hiratori, Nukkibetsu on the other. Between the two groups there also exist parallel ethnographical differences.

9. Hattori notes the following possibilities in the light of dialect geography.

9.1. parúnpe (44, *tongue* and a derivative of par *mouth*) with distribution not coterminous with par, 42, *mouth* is a possible reflection of borrowing. Par is found in Yakumo, Oshamambe, Horobetsu, Hiratori, Nukkibetsu, Niikappu, and Asahikawa dialects (the rest have car for *mouth*) while parúnpe is found not only in the above seven dialects but also in Samani, Obihiro, Kushiro, Bihiro and Nayoro which have car for *mouth*. 'aw *tongue* in the Sakhalin dialects, Sôya, and Nayoro, seems to be an older Ainu form than parúnpe. The split into par and car for *mouth* was probably through sound changes. A new derivative parúnpe formulated in the par-area seems to have spread into car-areas. A detailed study of 130, *lip* (Asahikawa has pár, parúnpe, cápus; Horobetsu has poetic forms sánca, sáncar) may reveal further interesting features.

9.2. As examples of borrowing from Japanese, Hattori notes menoko (16. *woman*), pone. poni (31. *bone*), sippo, sispo (147. *salt*), tane (24. *seed*), tamanko (33. *egg*), hana (137. *flower*), onanci (50. *neck*). Of these, *bone*, and *salt* appear to be of the earliest borrowing since the forms are in all Ainu dialects. Menoko for *woman* is found only in Hokkaido dialects and may be considered as a later borrowing. The rest with more restricted distribution are considered to be of even later borrowing.

9.3. All dialects have /h/. In addition, the dialects of Obihiro, Kushiro, Bihiro, Asahikawa, Nayoro have /'/ (voiced h). Hattori explains that /'/ in the five dialects is the result of voicing an initial /h/ in forms with a prosodic nucleus in the second syllable, while /h/ was retained in forms with a prosodic nucleus in the initial syllable. For items 67, 87, 132, 157, 187 all dialects have /h/. For items 64, 123, 145, 151, 194, 195, the five dialects noted above have /'/, while the rest have /h/. As exceptions to the above generalization, Bihoro has /h/ for 45, and 116, in which the rest of the five have /'/. Bihoro, on the other hand, has /'/ for 49, which appears with /h/ in other dialects. Hattori considers the postulation of two proto-phonemes to account for the two reflexes.

10. In reference to his earlier article On the Method of Glottochronology and the

Time Depth of Proto-Japanese, Gengo Kenkyu, nos. 26/27, pp. 29–77, 1954, and to D. H. Hymes, Lexicostatistics So Far, Current Anthropology, 1.3–44, 1960, Hattori reiterates that a figure smaller than 2 (1.4 is tentatively suggested) should be used in

$$t = \frac{\log C}{2 \log r} \qquad (r: 0.81)$$

11. In comparing the present study with an earlier lexicostatistic study of Japanese mainland dialects (Tokyo, Kyoto, Kagoshima) and Okinawan dialects, published in Amami, March 1959, Hattori notes the following:

The Hokkaido dialects as a group do not share the following items with the Sakhalin dialects: (5), 6, 9, 15, 47, 59, 64, (102), (103), 104, 108, 121, 124, 136, 177, 180, 186. Japanese mainland dialects as a group do not share cognates with the Okinawan dialects as a group in the following items: 2, 10, 14, 17, 29, 38, 46, 47, 49, 68, 72, 94, 101, 113, 126, 127, 143, 144, 145, 146, 151, 167, 182. In the above two lists, only 47 *knee* is found in both, and the two languages thus seem to have had different drifts, so far as stability of form-meaning connections in basic vocabulary is concerned. Hattori considers the scarcity of overlap as indicative of the possibility that Swadesh's list does not necessarily contain items of the same replacement rate for all languages.

12. Further, on the basis of examples cited in **9.2.** Hattori notes that, though limited, borrowing can take place in the basic vocabulary. In support of this contention, Hattori cites six Sinitic loans in Japanese (70, *heart*, 76. *hunt*, 77. *husband*, 95. *many*, 96. *meat-flesh*, 138. *sky*) and two Sinitic loans in the Shuri dialect of Okinawa (110. *other*, 138. *sky*) (cf. Gengo Kenkyu, nos. 26/27, p. 64, 1954).

As a suggestion for future long range comparisons, Hattori cites the following set of Potential cognates; Ainu: kur *shadow*, niskur *cloud* (nis *sky*), kunne *black* (kur + ne), ekurok *dark*; Japanese: kurasi *dark*, kuru *to get dark*, kuro *black*, ? kumo *cloud*; Korean: kurim *cloud*, kirim *soot*, kərim *soot*, kirimca *shadow*, ? kəm *black*; Tunguse: kurunyuk *soot*, ? komnomō *black*; Mongol: ? kara *black*, ? küräng *brown*; Turkic: kurim *soot*, ? kara *black*; Hungarian: korom *soot* (? from Turkic).

A Study of the Particles of the Saru Dialect of Ainu I. By Suzuko Fukuda. Minzokugaku-kenkyu ("The Japanese Journal of Ethnology"), vol. 24, no. 4 (1960), pp. 67–78.

A Study of the Particles of the Saru Dialect of Ainu II, Adverbial Particles and Final Particles. By Suzuko Fukuda. Gengo Kenkyu ("Journal of the Linguistic Society of Japan"), no. 39 (1961), pp. 21–38.

Fukuda's definition of the particle is "a set of grammatically defined words which always occur finally in a construction and never stand at the beginning of a sentence."

The particles as defined are subdivided by their "grammatical function (or distribution)" into (1) verbal, (2) nominal, (3) conjunctive, (4) case marking, (5) adverbial, and (6) final particles. The first article deals with 13 verbal particles, the second with 15 adverbial, and 12 final particles.

A verbal particle occurs only in the following environment indicated by ——.
verbal form A + —— = verbal form B, e.g., 'a, in 'é 'a *to have eaten before* ('e *to eat*).

An adverbial particle occurs in the following environments:

(1) verb-form A + —— + (modifier +) verb used like a verbal particle = verb-form B (2) noun-form A + —— = noun-form B (3) adverb-form A + —— = adverb-form B, e.g., 'anak, in cisétumam 'anak kí 'ani 'akár (wall/as for/miscanthus/by means of/is made) *As for the wall, it is made of miscanthus.*

A final particle occurs in the following environment:

form + —— = full sentence which is not

a verb form, e.g. wa *soft narration or information*, in pírka wa (good/-) *Never mind.*

Personal Affixes in the Sakhalin Dialect of Ainu. By Shiro Hattori. Gengo Kenkyu ("Journal of the Linguistic Society of Japan"), no. 39 (1961), pp. 1–20.

The material was gathered by the author at Tokoro, Hokkaido, during the summers of 1955 and 1956, from a 56-year old speaker of the Raichishka dialect.

Independent personal pronouns (possessive, nominative, objective), personal pronominal affixes (nominative, and objective) numerals, and their "sememes" (Hattori's term) are described.

The description of use of personal pronouns according to age groups and sex is noteworthy. The social categories are:

Age-group	Male	Female
2–4	hacikoo pon-hekaci	hacikoo heekopo
5–7	'ahkapo	heekopo
around 10	hekaci	ponmere-kopo
ca 15–over 20	'iwanehpo	merekopo
over 20–30's	yuhpo	nanna
40's–50's	'acapo	'unahpe
60's–80's	henke	'ahci
90's–	'ekas	suh

As illustration the 1st person singular forms are:

1. ku'ani toward the younger by yuhpo, nanna and older.
2. co'oka∼ci'oka (the second is more deliberate) used in allegro speech by 'acapo, 'unahpe and older.
3. 'anoka toward the older by yuhpo, nanna and older.
4. co'okayahcin∼ci'okayahcin used in allegro speech of henke.

Akusento so, onsetsu kōsō, kōon onso ("Prosodeme, Syllabic Structure, and Laryngeal Phonemes"). By Shirō Hattori. Study of Sounds, vol. 9 (1961), pp. 1–21. Tokyo.

Hattori notes that in his dialect (Kameyama, Mie Prefecture) the following prosodic patterns are observed by segmenting at the point of pitch-shift with concomitant change from lenis to fortis:[1]

1.	'OO	'OOO	'OOOO
2'.	'OO	'OOO	'OOOO
2''.	'O'O	'OO'O	'OOO'O
3.	'O''O	'OO''O	'OOO''O
4.	'O'O	'OO'O	'OOO'O
5.		'O'O'O	'OO'O'O
6.		'O'OO	'OO'OO
7.			'O'O'OO
8.			'O'OOO

Of these, 2' and 2'' are in complementary distribution. 'OO'O and 'O'OO, 'OO'OO and 'O'OOO vary freely. Morae with low pitch in initial position occur more fortis than those following one or more morae with high pitch. Such prosodic pattern may be more appropriately considered as a unitary phoneme co-occurring with a sequence of segmental phonemes than as a mere sequence of high and low pitch phonemes. This unitary phoneme is a *prosodeme*. The high pitch following the low in 2'' above may be lowered, while the high pitch preceding the low never is lowered. A high pitch before low, a prosodic nucleus, occurs in patterns 3–8 above and not in 1–2.

According to Hattori, there are four types of syllables in Japanese: /CV/, /CVV/, /CVN/, /CVQ/. /CV/ is 1 mora, the rest are 2 morae. The only consonant cluster that may occur in the C position is /Cj/. The author then comments on the plausibility of postulating a /'/, a laryngeal consonant phoneme which contrasts with /h/, as /b/, /d/, /g/ contrast with /p/, /t/, /k/ for Japanese, as well as for English, e.g. ill /'il/, buy /baj'/, making the minimal free form CVC. Any cluster in any of the three positions is marked by /‿/, e.g. blood /b‿ləd/, eye /'aj'/, held /held‿/. The author discusses current American theory as to juncture, and notes that the /+/ juncture proposed by Trager-Smith (Outline, 1951, p. 38) and

[1] The following symbolic modifications are made: ['] for Hatton's [ˈ], [ˈ] for [ˉ], [''] for [ˆ].

Hockett (Course, 1958, pp. 55ff.) can be dispensed with, e.g. nitrate /nájtrejt/ CV́CV̂C, night-rate /nájtrejt/ CV́CCV̂C.

(An English translation of the article is to appear in a collection of essays published by the International Christian University, Tokyo).

3. European publications abstracted by Dell H. Hymes:

Tungusisch und Ketschua. By K. Bouda. Zeitschrift der Deutschen Morgenländischen Gesellschaft, vol. 110, no. 1 (1960), pp. 99–113.

Dumezil has pointed out (with extensive material and in a convincing way) that Quechua is structurally and etymologically related to Turkish. [Remarques sur les six premiers noms de nombres du turc, Studia Linguistica 8.1–15 (1954); Remarques complémentaries sur les premiers noms de nombres du turc et du quechua, JSAP 44.17–35 (1955); (with H. Curien), Remarques statistiques sur les premiers noms de nombres du turc et du quechua, JSAP 46.181–188 (1957)].

Excited by this, and finding in his material new possibilities for comparison with Altaic, the author presents his observations in this direction. Quechua material is from Middendorf (Die einheimischen Sprachen Perus, Leipzig, 1890ff.), Tungus material from the author's own experience and collections. The article is but a first attempt. There remains work for Altaicists especially in clarifying the relationship of the two Altaic groups to each other, but that would lead too far from the point here. Clearly this attempt, which with few exceptions deals only with Tungus, still confirms the genealogical relationship of Quechua with Altaic, letting one recognize that still another ancient American *Kultursprache* stems from Asia.

In presenting word-comparisons (in as nearly as possible a phonetic order), not all examples of a correspondence are listed together. So as not to have to review the material too often, examples of one correspondence that are given under another are indicated at the end of a group by cross-references.

[There follow 112 numbered sets of Tungus-Quechua correspondences for 20 consonants, with occasional citing of Aymara forms, and 8 numbered sets of assorted correspondences between Quechua and other Altaic languages that were observed in the course of the work. In series order, and summed across initial, medial, and final positions, the number of correspondences of each Quechua phoneme can be approximately summarized: p 9; t 14; c 7/4; k 18; q 13; pH 2; th 3; ch 1; kh 1; qh 3; c' 7; q' 16; m 18; -n- 8; ñ 1; w 5; y 3; r 25; l 7/5; s 27. (Quechua c and ell have dual correspondences).

As a sample of the material, the following forms are arranged from the standpoint of the Ewenki dialect of Tungus, as taken from correspondence sets in which Ewenki forms with b- appear. Ew b- : Q p (sets 2, 5, 6): Ew bənə *jüngere Schwester*: Q pana *Schwester für den Mann*; Ew baka *finden, suchen*: Q suffixal -paq *im Hinblick auf*, paq-ta *Achtung, Vorsicht*, paq-u *sehend*; Ew bəjə *Körper, Mensch, Person*: Q paj *er, sie, es* (a noun form). Ew b- : Q pH (set 8): Ew baldy *geboren werden, wachsen* ("mit altem apikalem Verschlusslaut"): Q phanci *keimen, Knospen treiben*. Ew b- : Q w (set 11): Ew bul *mit der Hand streicheln*: Q wajl'u *liebkosen*. Ew b- : Q u (*bə) (set 12): Ew bəju *jagen*, bəju-n *wildes Rentier, Elentier, Huftier* (with nominal suffix): Q ujwa *Tier, Vieh* ("ujwa kann *bəjw(a) interpretiert werden"). (In the above forms, *j* is a semivowel, *y* a vowel).

Nambikuara Vocabulary. By Lajós Boglaar. Acta Ethnographica (Academiae Scientiarum Hongaricae), vol. 9 (1960), pp. 89–117. Budapest: Akadémiai Kiado.

The author succeeded in compiling a dic-

tionary during ethnographical field work in 1959 at Utiariti (Mato Grosso, Brazil) among the Elotasu group of Nambikuara, who had a temporary abode there. Most of the words were given by an Indian of the Waklitisu group who could read and write Portuguese, but nearly all males were keen to help. The Indians in question have been classed ethnologically as "Southeastern Nambikuara" (the "Kokozu" of Roquette-Pinto), and under "Groupe a. Sous-groupe a 1", linguistically, by Levi-Straus on the strength of the suffixes. Word lists have been published by Roquette-Pinto, Souza, Riou and Oberg.

The first list presented is by English gloss under ethnological categories. Four columns give native forms, the first as ascertained by the author, the other three whatever forms are found in the lists of Souza, Riou, and Oberg, respectively. The author's second list is a short Nambikuara-English dictionary in alphabetical order. Portuguese glosses are given for botanical and zoological expressions for which English lacks adequate counterparts. The informant's remarks are sometimes quoted, and uncertainty of meaning is indicated by question mark after the word, uncertainty as to exact scientific term or a Latin term by question mark under the word.

The notation recognizes nasalization, dynamic accent, reduced sound, consonance; a, e, i, o, u, both long and short, and ü; b, d, g; t k; ts; s; m n ṇ [velar]; h ("nasalized hn (as in the German prefix 'hin')"); l r y w.

The first list has 448 forms (a few repeated under different categories) plus 20 phrases. The second list has 454 forms plus the same 20 phrases. Only A B D E H I K L M N O P S T U W Y occur as section headings in the second list (long, short, and nasalized vowels are listed together).

Une Tribu Indienne peu connue dans l'état Brésilien Paraná (Résultats de l'expédition de janvier 1958). By Čestmir Loukotka. Acta Ethnographica (Academiae Scientiarum Hungaricae), vol. 9, no. 3–4 (1960), pp. 329–368. Budapest.

In 1899 the Brazilian colonel Borba discovered captives from a previously unknown tribe among Kaingang at Barreiro. In 1907 the Czech Frič found two captives in the Kaingang village of Ubá; they were also studied in 1912 by Nimuendajú. The Kaingang called them 'Kurutons' (*without clothes*). Each explorer reported a different tribal name: Aré (Borba), Šeta (Frič), Yvaparé (Nimuendajú), but the samples of language are identical. (Borba (1904)—short collection of words; Frič—short collection published by Loukotka (1929); Nimuendajú —brief information in his posthumous (1946) report. Loukotka searched vainly among Nimuendajú's manuscripts in the center of the Concelho Nacional de proteção Índios at Rio de Janeiro for the original linguistic notes, and his dictionary, of which he had spoken to Loukotka in 1940).

In 1957 Loukotka was invited to join an expedition into the Dourados mountains to an Indian tribe just discovered there a few years before. Brazilian scholars refer to it as Xetá (Šeta), taking it as that whose two members were studied by Borba, Frič and Nimuendajú. Loukotka reports on the habitat and appearance of the tribe, clothing and decoration, food, technology, mode of life, social structure, and religion (of which he could learn little, since, lacking an opening in his lower lip and a labret in his mouth, he could be, by their standard, only a prepubescent, while the religion was the privilege of male adults). He gives also 570 words of which 188 can be compared with words of the Šetas (also given); 317 words are reported only from the Indians of the Dourados and 65 only from the Šetas. Only 57 are identical or at least related, and this 30.19% is quite insufficient to consider the two languages identical. The two are related as members of the Tupian family, Šeta corresponding nearly entirely to Guarani, while the list of the tribe of the Serra dos Dourados

shows, according to Loutkotka, nearly 50% of foreign influences, but unknown and indeterminable in provenience, showing no relation with other languages of Paraná or even Brazil.

Thus the view that the Dourados tribe is the Šeta of Frič is refuted not only by Loukotka's observations on material culture and mode of life, but in the first instance by language.

The correct name of the Dourados tribe remains unknown. A phonetic table shows close i e a, open ü ö u o; au; quantity, principal accent, nasality; h (aspiration); postpalatodorsal k g x y ł ng; aveolo-apical t d s z r l n; aveolo-dorsal t' d' š č dž l' ň; labial p b f v m; labiovelar w. A paralinguistic observation is that in speaking to these generally peaceful, affable, gay people, one may pay careful attention to tone, since they suffer no one to shout at them. A slightly raised voice already offends them, and only with a tranquil, amiable tone, accompanied by a smile, can one speak to them if one wishes to accomplish something. While not understanding the language, they sense what is involved from tone and manner of speaking; they then are obstinate and remain silent a long time: they quite simply ignore the vociferator.

NOTES AND REVIEWS

Arawakan for *path, bone, hand*: A Semantic Problem of Reconstruction

Douglas Taylor

In a considerable number of Arawakan languages, the word for *bone* seems to be closely related to that for *path*, to that for *hand*, or to both. So, out of fifty words or stems drawn from twenty languages, of which eighteen are glossed as *path*, seventeen as *bone* and fifteen as *hand* (the equivalents being, with few exceptions, obviously probable cognates), fifteen of the first, sixteen of the second and fourteen of the third appear to have once had in common a stem which might be reconstructed as *apu. On the other hand, seventeen of the forms meaning *path* appear to have contained a stem which might be reconstructed as *(at)ina, seven of those meaning *bone* one which might be reconstructed as *ina, and fourteen of those meaning *hand* an attributive prefix ka- common to almost all Arawakan languages. The purpose of the present note is to furnish evidence for this statement, and to seek a solution to the semantic problem that it involves.[1]

For the sake of convenience, the several languages may be referred to by number: 1 Island Carib, 2 Lokono, 3 Goajiro, 4 Wapisiana, 5 Baré, 6 Guinao, 7 Adzaneni, 8 Piapoco, 9 Mandauaca, 10 Ariti (Paressi), 11 Carutana, 12 Catapolitani, 13 Yavitero, 14 Baniva, 15 Mehinacu, 16 Cuniba, 17 Moxo, 18 Yaulapiti, 19 Palicur, 20 Piro. Where a language's equivalent for one or two of the items has not been found, this will be shown by a dash preceding punctuation. The recorded forms for *path*, *bone*, *hand* now follow in that order.

1 mábu, ábu(hu), úkabu; 2 uáburúku & abúnahahü, abúna(hahü), úkabu; 3 wopuh, himpu, ahappu; 4 dinap, unewiire, kaburei; 5 dinabu, abi, kabi; 6 tenabo, abe, kabi; 7 anipo, api, kapi; 8 ayapu, api, kapi; 9 enuhu, yahiži, kahi; 10 a(h)u, nahe, kahe; 11 enipu, —, kapü; 12 inipu, —, kapi; 13 daneho, —, kahahi; 14 tanepo, api(una), —; 15 —, inapü, kapu; 16 hatönõ, hapö, —; 17 ačene, (e)ope, —; 18 —, napi, —; 19 aheni, apiti, waku; 20 —, xapui, —.[2]

[1] Except as otherwise stated in the text, Island-Carib and Lokono forms and glosses cited in this note are taken from the oldest sources available to me: Raymond Breton's Dictionnaire caraïbe-françois (facsimile edition, Leipzig 1892) et françois-caraïbe (facsimile edition, Leipzig 1900) for the former, the Herrnhuter (anonymous) Arawakisch-Deutsches Wörterbuch (published in tome VIII of the Bibliothèque Linguistique Américaine, Paris 1882) for the latter. Forms belonging to other languages are taken, for the most part, from the comparative Arawakan vocabulary in C. H. de Goeje's The Arawak Language of Guiana, Amsterdam 1928.

The spelling of the various forms has, for the most part, been left unchanged; and is in all likelihood broadly phonetic rather than phonological. But except for direct quotations, I have transcribed the forms of Island Carib according to my own analysis, and those of Goajiro according to that of Nils M. Holmer. In the case of Lokono, the only changes made are the simplification of some double consonants (which almost certainly do not represent true geminates), and the replacement of j and w by i and u.

[2] This list may be supplemented by items taken from Robert Shafer's recent compilation Algumas equações fonéticas em Arawakan (in Anthropos 54 [1959], pp. 542–62), which I received while the present note was in press. Add to 11 and 12: -ápi *bone*, to 14 -ápi *hand* and to 18 -kápi *hand*. A few forms differ slightly, as given by Shafer, from those cited by de Goeje (and reproduced here): 6 kabe instead of kabi, 9 enuhũ instead of enuhu, 11 kapi instead of kapü, 13 kãhi instead of kahahi, 14 tsim-ãpi instead of api(una), 16 ĩhapĩ instead of hapõ, 18 inápi instead of napi, 20 ihapui instead of xapui.

Moreover, the following words for *path*, *bone*, *hand* (in that order) from other Arawakan languages may be added; Siuci: inípu, -ápi, -kápi; Warekena: anipu, -iapi, -kápi; Tariana: inipu, -ápi, -kápi; Wainuma: idźápu, -ápi, -kápi; Maipure: anépu, —, -kápi; Custenau: —, anápi, -kápi; Yaulapiti: —, inápi, -kápi; Yucuna: hiiepu, —, -kóbo (*finger*).

Of the forms glossed *path* I assume: mábu (1) < *nábu, uábu- (2) < *iábu- < *inabu-, wopu- (3) < *yapu- < *inapu-, and ayapu (8) < *ainapu < *adinapu (cf. Yucuna hiiepu *path* < *hinapu). Some parallels are: attested nábi > mábi *sweet-potato* in 1 and nibi > mibi *liana or bush-rope* in 2 for assimilation to a following labial, attested adita > aitə *know* and aditi > aiti *son* in 2 for loss of intervocalic d, attested inínie > iéie *tongue* (whose equivalents in 2 and 3 are -ie and -iyee respectively) in 1 for loss of n by way of palatalization after a high front vowel.

All the forms glossed *path* except that in 10 show signs of having contained my hypothetical *(at)ina; which appears to have been the only stem in 16, 17 and 19. But its parenthetic element may well have been a prefix if, as seems likely, both reconstructed stems are to be found in Lokono abúnahahü *path*[3] (< *apu + *ina, in reverse of the more common order: *ina + *apu), which is homophonous with the same language's word for *bone* (cf. also *path* in 12 and *bone* in 15); and if so, the stems labelled *(at)ina and *ina are probably identical but for the prefix.

Of the forms glossed *bone*, only seven (if we exclude that belonging to 4, whose relationship to the others seems dubious) appear to have contained *ina, preceded (2, 14) or followed (3, 9, 10, 15, 18) by *apu. After what has been said above, such assumptions as himpu (3) < *(h)inapu and yahi- (9) < *inapi- will, it is hoped, seem plausible without the citation of further parallels.

More likely to be queried is my assumption that two such equivalents as -ábu (1) and -abi (5) *bone*, or -kapu (15) and -kapi (12) *hand*, are true cognates. But since body parts (like kinship terms) are rarely if ever referred to in Arawakan languages by absolute nouns, we should expect some of the forms cited here to contain or have contained a dependent suffix, such as may still be present in kabu-rei of 4. And suffixes that have become redundant tend to be reduced, dropped, or merged with the stem as in Island-Carib -iuábu-li > -iábui > -iábi *arrival or coming*; with which compare xapui (20), inapü (15), napi (18)—all glossed as *bone*, and most probably cognate.

But then comes the semantic problem. In describing the modern Central American dialect of Island Carib, I made mention of some morphological nouns "translatable by English prepositions, and showing—like the latter—a considerable degree of polysemy"; and then illustrated from my texts various uses of "-ábu *behind* (*supporting, underlying, outdone by, in the rear of*), *with* (*carrying, possessed of*)" (v. IJAL 22.36, section 11.31). The same form appears in Breton's 17th-century dictionary of the Dominican dialect as "ábou *à, sous*" (so, from "ákêle *gosier*", "ákêle ábou *le dessous du gros orteil*, parce qu'il est rayé, comme le col de la tortue"), and in various examples of its use where it is translated otherwise: "nitem tábou *il s'en est allé avec, il l'a emporté*" (tábu *with it*), "ikira aboúcoura nhábou *il a pris le timon, il les gouverne*" (nhábu *behind them*). Its Lokono cognate is given in the anonymous 18th-century Arawakisch-Deutsches Wörterbuch as "abu, abbu *mit, von, vor, bei*"; but here again examples make it clear that reference may be either to underlying position (in space or in time) or to actual possession in the sense of *holding*.

Now in Lokono as in Island Carib, úkabu is the usual word for *hand*, though we are told that in the former language it refers to "die Hand, insonderheit das Vordertheil, die Finger", while "die ganze Hand von den Fingern bis an das Gelenk" was called úkabukútu; a word apparently related to the

[3] De Goeje tells us that this Lokono word for *path* can take personal prefixes to mark possession, while uáburúku cannot. On the other hand, the author of the Arawakisch-Deutsches Wörterbuch lists: "abbunahahü *Pfad, Weg*", "wáburúkku *Fussteig, Weg*"; and gives possessed forms of the latter ("dáwaburúkkun, búwaburúkkun"), but not of the former. Both authors are agreed, however, that "abbúnahahü *Knochen, Gebeine, Gräte*" has possessed forms as in "dabbúna, babbúna, tabbúna, etc."

same language's verb abúkuta *catch, grasp, hold* (cf. also Island-Carib abúkura *steer* and abúta *pick up, gather or take in*). It therefore seems not implausible to suggest that úkabu *hand* of both languages may consist of a nominalizing prefix u- together with -kabu *holding*; and that the latter form and its cognates may be derived from that discussed in the preceding paragraph by means of the attributive prefix KA-.

On the other hand, Island-Carib íuna—Breton's "íona *base, fondement, tige, tuyau*"—can refer to the *stem* of a banana-tree, to the *stern* of a ship, or else enter into composition with stems meaning *head, foot, tooth or teeth* to form compounds meaning *neck, heel, back teeth*—"c'est à dire", as Breton himself puts it, "la base de la teste, du pied, des dents". Apparently cognate with this Island-Carib form is Lokono "ûinna *das äusserste, das Ende*", which also can refer to the *stern* of a boat, and enters into composition with ari *tooth/teeth* to form arina *back tooth or teeth*, with adena *forearm or wing* to form adenaina *upper arm or shoulder*.

It may be noticed that, in anatomical reference at least, both Island-Carib íuna and Lokono üina designate *proximal end or part* rather than either *base* or *end* without qualification. And although the word 'proximal' may be out of place in other contexts, it conveys what I believe to be meant there also. For example, in the modern Central American dialect of Island Carib, uaíuna *our forbear* refers to the common ancestor or founder of our line; and in Lokono -inabu ∽ ûinabuhü "*hinten darin*" (Wörterbuch)[4] or "(*following, etc.*) *after*" (de Goeje), the first member of this compound refers to a *point of attachment*, the second to position *behind* or direction *after*, in place or time. And in support of the latter part of this interpretation I may cite from the Lokono Wörterbuch, s.v. abu: "dánuhu waria ábu *von heute an*" (dánuhu *today*, waria *from*).

It is not hard to understand how a stem ábu *behind, supporting, bearing*, etc., either alone (Island-Carib -ábu) or in composition with íuna or ûina *proximal part* (Lokono -abúna), could come to refer more specifically to *bones*. So, in the context of nanákane *my loins* of early Island Carib, the two referents of -ábu, *support* and *bone*, coincide, yielding nánakanábu *my backbone*; (cf. anágani *back*, nanága *my back*, nanáganabu *my backbone* of the modern Central American dialect).

But though the meanings of the two stems ábu and íuna or ûina may admit—when they enter, differently ordered, into composition one with the other—such seemingly divergent reference as appears in Lokono -inabu "*hinten darin*" (cf. Mehinacu inapü *bone*) and -abúna *bone*, how can the latter construction, in its absolute form abúnahahü at any rate, also refer to a *path*? The semantic relation is, I think, with "hinten darin" rather than with "bone"; and the case for such a connexion may be worth stating. Breton translates Island-Carib mábu by *sentier, route*; giving for *chemin* another and borrowed (Karina) word that is still in use with the meaning *path, road*. And mábu now means not *path*, but *journey, way*—as in "he was three days on the way". It may therefore well be that a prototype of the words for *path* at first designated: *(at)ina (*way taken in getting from*) *starting point* *apu *on (to destination)*.

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[4] It may be objected that since (ü)ina- has kept that shape in this compound, it could not ever have been present (and have suffered such change as I postulated) in uáburúku *path*. But if the former were of comparatively recent formation, and the latter ancient, the apparent inconsistency would be comprehensible; cf. English housewife, besides hussy.

GRANDCHILDREN VERSUS OTHER SEMIDOMESTICATED ANIMALS

DOUGLAS TAYLOR

Independent parallel developments in related languages no longer in contact are interesting enough to deserve notice, even when they can be explained rather simply, as in the case of: (aspirated) p > f of both

Island Carib and Lokono (True Arawak) within the past 150 years. Here I should like to draw the reader's attention to what seems to be a more intricate parallel drift affecting both these languages in some forms only: the backing or rounding (or both) of earlier mid or high front unrounded vowels, as in Island-Carib anéga > anóga *to carry*, Lokono anika > anoka *to take or to carry*.

The phonemes of modern Central American Island Carib (for which see IJAL XXI, p. 233ff) include five vowels, /a e i o u/, stress (V̆) and nasalization (V̨); of which it will suffice to say here that /o/ varies from high to mid back unrounded ([ĭ] to [ĕ]), and /u/ from high to mid back rounded ([u] to [o]). The 17th-century Dominican dialect, as portrayed in Father Raymond Breton's dictionary (Auxerre, 1665–66) and grammar (Auxerre, 1667), appears to have had the same vowel phonemes, which Breton wrote: "a", "e" (described as like the e of Latin), "ê" (described as like the e of Fr. me, te, se, etc.) or, especially when stressed, "eu" (likened to the same digraph of French), "ou" or "o" (many instances of the same form with either spelling), stress marked by acute or grave accent, and nasalization—as in French—by syllable-final m or n (many instances of the same form with either nasal); but their distribution differs in many cases from that found in modern C. A. Island-Carib.

So, for example, we take the following entries from Breton's dictionary:

"iégue, *animal qu'on nourrit.*" (a form borrowed from Karina)

"fliguini, *animal que je nourris*, voyez iégue; les femmes disent níliguini, *mon nourrisson, mon enfant.*"

"*mon animal*, iégue, f. nillíguini; *j'ai un animal*, teguénnêtina, f. kalleguênnêtina." And, s.v. *fils*:

"*petit fils, fils du fils*, iégue, ibáli, f. nílliguini."

It appears from this list that the same inherited term might then refer to a *grandchild* or to a *domesticated* (*or semidomesticated*) *animal*, and that its basic shape then contained four occurrences of the vowel /i/ (and none other). But in the Central American dialect of this language I recorded only borrowed (Karina) ibári for *grandchild*, and ilógoni, -(i)lógo for (*semi*)*domesticated animal*, as in: tilógo gabáiu (from Sp. caballo) *her horse*, lilógo áu̯li (áu̯li *dog*) *his dog*.

Turning to Lokono, we now take the following entries from the anonymous Arawakisch-Deutsches Wörterbuch (in BLA, tome VIII), whose author wrote six vowels (a e i o u ü), and which was probably compiled in the late 18th century.

"illikin, *lebendige Kreaturen die einem zugehören, Vieh*; darunter sind begriffen: Rinder, Hühner, Vögel, Hunde."

"wellikínti, *ein Enkel oder Urenkel* (doch nach ihrer gewöhnlichen Art brauchen sie dies Wort von entfernten Graden der Verwandschaft); üllikíntu, *Enkelin*."

Human and non-human referents are here distinguished by a suffix, -ti or -tu, indicating the former's sex, and possibly (though rather doubtfully from a phonological point of view) by some initial differentiation; but in either case, the same stem, -likin-, appears to be used. Subsequently, however, it must have split; for Nancy P. Hickerson, who recently investigated the same language, lists -likin *pet* and -lukun- *grandchild* as different stems (S60 and S62 on p. 297 of IJAL 20); while Herman van Renselaar (who was good enough to send me a long list of Lokono kinship terms as recorded by himself) gives dalïkį̈ĉi' for *my grandson* (SoSo or DaSo, man or woman speaking), dalïkïto' for *my granddaughter* (SoDa or DaDa, man or woman speaking).[1]

[1] A Taino cognate of Island-Carib "íliguini" and of Lokono "illikin" may be contained in a passage from Ramon Pane, cited by Paul Radin (Indians of South America; New York 1946; p. 15) in Bourne's translation (E. G. Bourne, Columbus, Ramon Pane and the Beginnings of American Anthropology; Worcester, 1906): "His grandson on his father's side was named Hia Guaili Guanin which means grandson of Hiauna; and thence thereafter he was called Guanin and is so called today." It seems likely

Van Renselaar's transcription, I take it, is phonetic (he mentions using the acute accent for high tone, the grave for vowel duration with falling tone, raised comma for the glottal catch, ï for a shwa-sound and ê for Dutch tj); but it seems worth noting that his dádokóêi' *my grandfather* and dákïtï' *my grandmother* agree with the A.-D. Wörterbuch (dadukutti, daküttü) and with modern C. A. Island-Carib /náruguti, nagóto/ in showing different vocalic patterns, whereas these terms' stems as given by Hickerson (-duku- and -kutu-) have the same vowels. Moreover, though Hickerson glosses -duku- as *grandparent, opposite sex* and -ku- as *grandparent* (in IJAL 19, p. 182), van Renselaar states clearly that the terms glossed *my grandfather* and *my grandmother* (see above) are employed alike by both sexes of either paternal or maternal grandparents.

Also in Breton's record of early Dominican Island Carib, these terms' cognate equivalents apparently have no morpheme in common (other than the personal prefix, n- *my*); so: "nárgouti *mon grand père*" and "aguétte *grande mère*, náguettêni *ma grande mère*". And in this last-cited construct form we see, with displacement of stress, "ê" replacing "e"; just as "ê" and "e" replace "i" of the basic form in his "kalleguênnêtina" (see above, third paragraph),—although here Breton seems to have been uncertain about stress, both basic and conditioned. But while Island-Carib "aguétte" > /agóto/ *grandmother* certainly shows phonological change, Lokono "daküttü" > "dákïtï" *my grandmother* probably shows none. On the other hand, Breton's Dominican "arrênna" or "areúnna" > (modern C. A.) -aróna *arm or wing* shows no phonological change; while its Lokono cognate equivalent, "adenna" (Wörterbuch) > "adǒna" (de Goeje, 1928) may or may not signify that such a change took place in this language.

Similar alternation of stem-vowels occurs in the modern C. A. dialect of Island Carib, so far as my data go, only in two or three nouns of Karina ancestry (óma *path* and némari *my path*, orému *song* and nerémuri *my song*);[2] and the finding in Breton's dictionary of such inconsistent spellings as appear in the following entries inclines one to believe that his "e" and "ê" or "eu" were,

[2] In modern (Cariban) Karina, according to information kindly supplied by B. J. Hoff, alternations of o/e in anlaut of many (but not all) nouns and verbs are regular in the morphology; so: o:ma *path*, but maina e:marï *garden path* (*path to the garden*), o:manon *falling or diving*, but e:manon *throwing* (*something*) *down*, wo:mae *I fall* (*or I dive*), but se:mae *I throw* (*it*) *down*. Such alternations do not occur, however, in other positions or in other word classes; so that, if we may judge by the shapes of some Karina loanwords in Breton's Island Carib compared with those of their models' modern cognates in the source language, it would seem that there has been, in Karina as in Island Carib and in Lokono, a tendency to back and/or round earlier front unrounded vowels. So, compare the following items (the first three of which do NOT show this change) in early Dominican Island Carib (Breton's spelling), modern Central American I.C. (whose /o/ I write here, to avoid confusion, ë), and modern Karina (whose /o/ = [o]):

GLOSS	DOM. I.C.	MOD. I.C.	MOD. KARINA
new	ichéri	iséri	iseirï
sun	huéyou	uéiu	we:yu
wood, tree	huéhue	uéue	we:we (-we:rï)
ax	houéhoue	(-áuëri)	wï:wï (-wï:rï)
man	ouekélli	uëgëri	wokï:rï
woman	ouélle	uëri	wo:rïi
mountain	ouébo	uébu	wï:pï
stone	tébou	débu	to:pu
come	néboui	(n)iébui	wo:pï
fish-hook	kéoue	géui	ko:we
three	éloua	érua	o:rua

that we have here a mixture of typographical or scribal errors and of Taino punning. Pane could have written the same name both as Hiagua and as Hiauua (rather than Hiauna); and if so, iliguanin represents the form meaning grandson. But Pane tells us elsewhere that 'guanin' was the Haitian name for a kind of gold alloy and for the South American continent from which it came; and it is possible that Taino had a bound form *-ili *grandson of* employed analogously to its -el (cf. Lokono elon- *child*) meaning, we are told, *son of*.

in some cases, variants of the same phoneme: "ekétona, leketona, *semence d'homme, sa semence*", but "*semence d'homme, sperme*, leukeútêna, f. lókêle". On the other hand, his "chéba . . . *verse* . . ." and "nechéroni *ce que j'ai versé*" versus "cheúba . . . *rostis*" and "nacheúroni *ce que j'ai rosti*" show the same distinction as do their modern reflexes, sé-ba *pour out!* (imperative 2nd sg.) and néserų *that which I have poured out* versus só-ba *roast!* (or *sting!*) and násorų *that which I have roasted*, násohą *that which I have stung*.

It may be that a clarification of modern Lokono phonology would be of considerable help in reconstructing the historical phonology of Island Carib. A correspondent now in Surinam tells me that in the Lokono dialect that he is trying to investigate, [dakótji] varies freely with [dakúti], meaning *my foot*, [daléroko] varies freely with [daléroko], meaning *my mouth*, while phonetically stable [ətəhə] *blood* (with level tone or stress) yields construct [daténa] *my blood*. Finally, he believes that tone or stress, vowel duration and in some cases even vowel quality are bound up with the morphophonemics of the language; and that only after a thorough study of the latter will it be possible to answer the question: 'how many vowel (and other) phonemes?'.

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THE SOUTHWESTERN WORDS FOR CAT

HERBERT J. LANDAR

In posing a complex problem of word diffusion,[1] I did not have the valuable information which William Bright has now provided: "Spanish mozo *boy, manservant*, feminine moza, are recorded in the meaning of *cat* by the dictionaries of the Royal Spanish Academy since 1726 . . . the occurrence of Spanish moza *cat* in the Southwest seems the most likely explanation for Hopi mó·sa and its congeners."[2] Bright's argument seems to be that all of the cat words which I listed derive most likely in one way or another from Spanish moza.[3] I would like to strengthen what I take to be Bright's argument by refashioning it somewhat.

To strengthen the argument, I must first note some of its weaknesses. There is a possibility that the masculine form functioned as a generic term and perhaps was used more frequently than the feminine form; cf. Spanish gato *cat*, gata *female cat*, Italian gatto *cat*, gatta *female cat*. The borrowing of mozo would be a more comfortable assumption, I think, than the borrowing of moza. A more serious objection follows upon the assumption [IJAL 25.273] that "words borrowed by the languages in question involved phonetic substitutions, with use of native phones as similar as possible phonetically to foreign phones." Spanish moza *cat* with its o helps, if one overlooks a shift in stress and loss of -to/-ta, in explaining Navaho 'mósí *cat*, provided that Rio Grande colonists used the diminutives mozito, mozita *little cat*. The o of moza does not upset one in the case of Hopi mó·sa *cat* or Acoma mú·sa *cat*, since the stressed vowels are phonetically ambiguous: Hopi o and Acoma u are back rounded vowels, and for each language there is no

[1] The diffusion of some Southwestern words for cat, IJAL 25.273–4 (1959).

[2] A note on the Southwestern words for cat, IJAL 26.167–8 (1960), p. 168.

[3] From Wick R. Miller, Spanish loanwords in Acoma: I, IJAL 25.152 (1959); II, IJAL 26.42 (1960) one adds: Santa Ana, San Felipe, Santo Domingo mú·sa and Acoma mú·sa. Miller (42): "Whorf and Trager give the Uto-Aztecan reconstruction *müsa *cat, feline animal* without any supporting forms"; and (42 n. 15): "Lawrence B. Kiddle has informed me in a personal communication that he has found the forms [mis, mísi, móso, mósi, míči, mič, miš, miši], all meaning *kitty* in American Spanish. All except [móso] and [mósi] have come from interviews with speakers of American Spanish. Kiddle has found these words borrowed into Indian languages from the pueblo area through Mexico to South America. Almost all the languages of Northern Mexico and the Southwestern United States have borrowed this word [*sic*; I think perhaps there were several words] with a high back vowel in the first syllable, whereas in other areas of Spanish America the first vowel is most often a high front vowel."

opposition /u/:/o/. The o of moza becomes embarrassing, however, in cases where there is an opposition of /u/ and /o/ as in Taos and Zuni.[4] Why do we find Zuni mu:sa *cat*, and not mo:sa? Did the colonists who followed Juan de Oñate carry with them, along with their cats, a word with stressed u? Perhaps. If one assumes that Spanish in the days of early settlement had call-word doublets, some marked for gender and others not, all deriving from Late Latin musio *cat*, the argument for diffusion from Spanish is strengthened. Embarrassing phonetic incongruities may be resolved. One need but point to processes such as palatalization, umlauting, and the like, to relate many forms to musio. Compare (with x, sc = š) Catalan -musa, moxa, mixa *cat*, Ferraran moss *cat*, Milanese mosa, misc *cat*, miscin *pussy*, Neapolitan mosillo *cat*, Piedmontese mosi *cat*, Sardinian mussi *pussy*, Sicilian musso, mussu *cat*, Tuscan mucio, micio, -a *cat*, Spanish muixo, mozo, micho, -a, miz, mizo, -a *cat*, michino, misino *little cat*.[5] It would seem that not all of the Southwestern words for *cat* represent a single Spanish form, but rather that they represent a rash of Romance doublets which are connected to a Late Latin form. The likelihood of Southwestern borrowing of words for *cat* with Spanish moza as a starting point involves oversimplification.

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The American Philosophical Society will consider applications for modest grants-in-aid of research for projects pertaining to American Indian linguistics and ethno-history. Grants are not ordinarily made in support of the preparation of doctoral theses. Applications should be submitted to Dr. Richard H. Shryock, American Philosophical Society Library, 105 South 5th Street, Philadelphia 6, Pa., by March 1, 1962.

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[4] For phonological details, see Benjamin Lee Whorf, The Hopi language, Toreva dialect, in Harry Hoijer et al., Linguistic Structures of Native America [LSNA], Viking Fund Publications in Anthropology 6 (1946), p. 161, and cf. Charles F. Voegelin and Florence M. Voegelin, Hopi Domains, IJAL 23.59 (Mem. 14, 1957); Miller 1959, p. 148; George L. Trager, An Outline of Taos Grammar, LSNA, p. 187; Stanley Newman, Zuni Dictionary, IJAL 24.1, Pt. II (1958).

[5] See W. Meyer-Lübke, Romanisches etymologisches wörterbuch (Heidelberg, 1935), p. 476; Lazare Sainéan, La création métaphorique en français et en roman, Beihefte zur Zeitschrift für romanische Philologie I (Halle, 1905), p. 19.

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